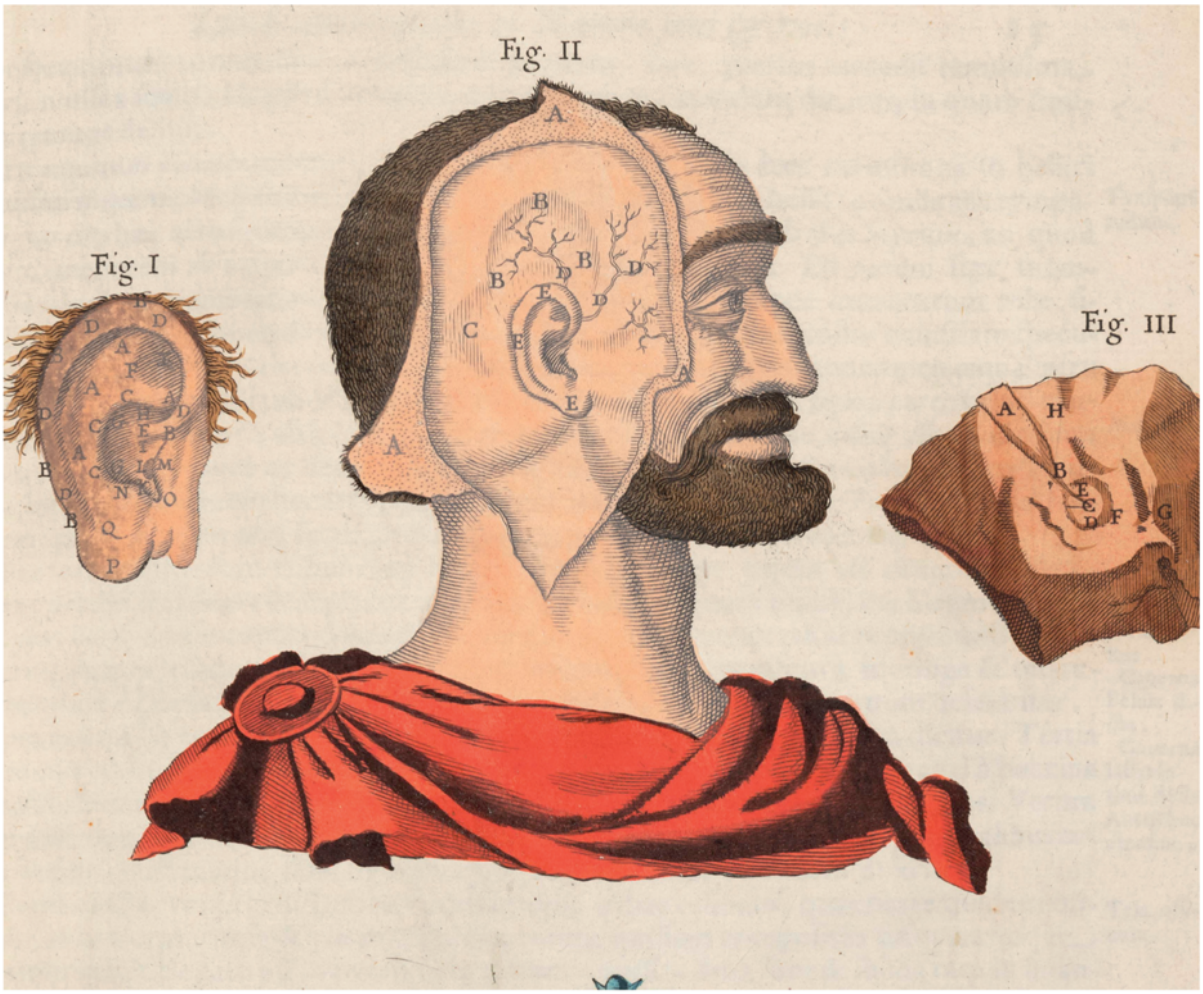
The Routledge Companion to Music, Mind and Well-being



Edited by Penelope Gouk, James Kennaway, Jacomien Prins and Wiebke Thormählen

THE ROUTLEDGE COMPANION TO MUSIC, MIND AND WELL-BEING

In recent decades, the relationship between music, emotions, health and well-being has become a hot topic. Scientific research and new neuro-imaging technologies have provided extraordinary new insights into how music affects our brains and bodies, and researchers in fields ranging from psychology and music therapy to history and sociology have turned their attention to the question of how music relates to mind, body, feelings and health, generating a wealth of insights as well as new challenges. Yet this work is often divided by discipline and methodology, resulting in parallel, yet separate discourses.

In this context, *The Routledge Companion to Music, Mind and Well-being* seeks to foster truly interdisciplinary approaches to key questions about the nature of musical experience and to demonstrate the importance of the conceptual and ideological frameworks underlying research in this field. Incorporating perspectives from musicology, history, psychology, neuroscience, music education, philosophy, sociology, linguistics and music therapy, this volume opens the way for a generative dialogue across both scientific and humanistic scholarship.

The *Companion* is divided into two sections. The chapters in the first, historical section consider the varied ways in which music, the emotions, well-being and their interactions have been understood in the past, from Antiquity to the twentieth century, shedding light on the intellectual origins of debates that continue today. The chapters in the second, contemporary section offer a variety of current scientific perspectives on these topics and engage wider philosophical problems. The *Companion* ends with chapters that explore the practical application of music in healthcare, education and welfare, drawing on work on music as a social and ecological phenomenon.

Contextualising contemporary scientific research on music within the history of ideas, this volume provides a unique overview of what it means to study music in relation to the mind and well-being.

Penelope Gouk is Honorary Research Fellow at the University of Manchester, UK, where she lectured until her retirement. Throughout her career the dominant theme of her research has been the intellectual history of music in early modern science and medicine. Most recently she has been investigating changing explanations for music's emotional effects, especially in Britain. Her publications include *Music, Science and Natural Magic in Seventeenth-Century England* (1999) and edited volumes *Musical Healing in Cultural Contexts* (2000) and, with Helen Hills *Representing Emotions: New Connections in the Histories of Art, Music and Medicine* (2005).

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Wiebke Thormählen is Area Leader in History at the Royal College of Music in London, UK. Her research focuses on the formulation of music as a language of emotions and its particular role in educational theories and policies since the eighteenth century. Recently awarded a three-year collaborative research grant from the Arts and Humanities Research Council (*Music, Home and Heritage: Sounding the Domestic in Georgian Britain*) she explores the interaction of the domestic with the public in musical arrangements, in devotional music and in the relationship between music as domestic social activity and amateur choral societies in Britain.

Routledge Music Companions offer thorough, high-quality surveys and assessments of major topics in the study of music. All entries in each companion are specially commissioned and written by leading scholars in the field. Clear, accessible and cutting-edge, these companions are the ideal resource for advanced undergraduates, postgraduate students and researchers alike.

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Kircher's keen interest in anatomy is shown in the cut-away style of these anatomical drawings of the human head and ear, designed to show how the ear actually hears and responds to music.

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INTRODUCTION

Historical and Contemporary Perspectives on Music, Mind and Well-being

Penelope Gouk, James Kennaway, Jacomien Prins and Wiebke Thormählen

The last 30 years have seen a resurgence of interest in the connections between music, mind and well-being. This is hardly surprising as life has become inundated with music facilitated by its ever-increasing dissemination through digital technology. We no longer need to find a radio or CD player, let alone a live band. Each of us has a vast choice of music readily available through our preferred electronic medium and our choices are determined as often by loose emotional concepts such as music that is "sad," "happy," "relaxing" or "romantic" as they are by artist or genre. Social media abound with testimony to the use of music in daily life: to calm us, to inspire us, to distract us, to help us remember, to help us forget; to express ourselves or to avoid finding our own words; to bond with others or to shut ourselves off from the world; to intensify or overcome a particular feeling (Bull, 2007; Skånland, 2013). At the heart of all this lies the general assumption that music is somehow a "language of the emotions" with an almost magical link to our state of mind. Musical emotions are perceived to have an impact on the subjective sense of well-being and thus on psychological and physical health. In our everyday lives, the music-emotions-health nexus constitutes "common sense" on the subject, but doubts about its universal validity and questions around how it might function remain, at a time when research into the application of music's "powers" is mushrooming across a variety of fields.

A key reason for the boom in recent scientific interest in music, emotions and well-being relates to the remarkable advances in imaging technology in the neurosciences over the past few decades, which have led to the formation of a highly productive sub-discipline that has brought exciting insights into how the brain reacts to music. The neuroscience of music has also inspired scholarship in other fields such as cognitive psychology, psychotherapy and psychoneuroimmunology, as well as in applied studies such as rehabilitation and non-pharmacological pain management and is the basis of work on neurologic music therapy. At the same time, it has also created significant and intriguing intellectual challenges for future approaches to the subject. What is the relationship between the lived experience of music and the measurable biological markers that are the stock-in-trade of neuroscience? What are the limits of what brain science can tell us about music and emotion? What is the relationship between reward circuits in the brain and the social and historical construction of musical concepts and cultures? And for that matter, is music really all about emotion at all?

The idea itself that psychological processes can be mapped directly onto biological processes, with the apparent implication that mental states and emotions can be read from biological markers, has come under fierce attack. Some critics have accused the neuro-disciplines of ignoring the political and social context, and have argued that the field - in a way that is almost neo-phrenological - makes the mistake of thinking that locating brain activity using brain scans is the same as explaining the meaning of its function (Conway & Rehding, 2013; Legrenzi & Umilta, 2011; Tallis, 2014; Uttal, 2001). While scientific popularisers and the media have sometimes clearly been guilty of a hubristic approach to what brain research can tell us about music, serious researchers in the field have stoutly defended the epistemological basis of their work and acknowledged its limits (see Eerola; Taruffi & Koelsch in this *Companion*). In order to create empirically based models of how music affects the brain, neuroscientific approaches necessarily have to reduce complex human behaviour, but that is not a barrier to producing important and informative results.

Much excellent work has been presented in the related fields of music and health and music and emotions, most recently *Music, Health and Wellbeing* by Raymond MacDonald, Gunter Kreutz and Laura Mitchell (2012), the *Handbook of Music and Emotions* (2010) and its predecessor, *Music and Emotion: Theory and research* (2001) by Patrik Juslin and John Sloboda, which together demonstrate the rapid development in the field of the affective sciences over the first 10 years of the twenty-first century, as well as Tom Cochrane, Bernardino Fantini and Klaus Scherer's *The Emotional Power of Music* (2013) and, on a rather different note, there is also Oliver Sacks's *Musicophilia* (2007), which gives a literary-clinical description of neurological cases related to music.

Our *Companion* differs in two respects from these books. Firstly, it explicitly problematises the relationship between past and current scientific thinking on music, emotions and well-being, using historical perspectives to illuminate the ideological and cultural roots of contemporary musical and scientific concepts. It places contemporary understandings into a continuum of approaches instead of setting out a vision of a teleological march of progress, revealing the role of culturally determined concepts. It goes beyond traditional narratives of music and emotion, with many chapters using ideas of the embodied mind, and includes contributions that deal with scepticism not simply about music's "emotional power," but with the ideology itself that music has an inherent special relationship to the mind. As such, the *Companion* identifies a variety of theories on music's affective relationship to man, presenting a variety of conceptions of the temporal and dynamic nature of both music and the mind as an encapsulation of the self, that have been discussed and reinvented to suit changing socio-cultural contexts since Antiquity. Indeed, a Pythagorean-Platonic model of the soul (mind) in which music was considered to have an inherent relationship to the human self, forms the underlying assumption in many of the chapters presented here, while others point to the Aristotelian model that denied an a priori relationship between the soul and music. Finally, the book seeks to create a dialogue between theoretical and experimental approaches, with the hope of inspiring new research questions and methodological approaches that can further the investigation into the nature of music's impact on body and mind. We hope to inspire research that involves integration at the level of formulating research questions, research that is fully aware of its own ideological premises with respect to key concepts such as music, mind, emotions, human nature and well-being, and that is fully aware of the ideological pillars that hold its own disciplinary stakes and methods.

This *Companion* brings together case studies and state of research summaries from a wide variety of perspectives – neurology, psychology, sociology, education studies, history and musicology – to probe not only how music relates to the mind and emotions and how it has been or could be used in the process of maintaining or gaining well-being but also to push beyond this to the question whether the subject-object relational model traditionally used to investigate the "power of music" – in which music as a "thing" or even a "practice" acts on the individual who possesses mind, emotions and a sense of well-being – is a useful model in the investigation of a more inclusive conception of well-being that is based around individuals' accounts and perceptions. By placing

case studies and theoretical studies side by side, the book raises issues of voice, individuality and community as aspects of music that could be considered alongside biological markers. In other words, this *Companion* seeks to encourage a greater awareness of *agency* and the social dimension of music through self-reflexive research approaches, as well as of the role of historical and cultural contexts.

In this light, a central issue addressed in the book is the problem of the obvious lack of dialogue between the various disciplines involved and their lack of agreement on the conceptual framework used to explain the impact of music on the mind, emotions and well-being. The conceptual and philosophical challenges posed by the different disciplinary approaches to the impact of music give us the opportunity for further fruitful research based on an exchange of ideas between disciplines to create a multidisciplinary picture of the music, mind, well-being nexus. Our *Companion* therefore aims to demonstrate the value of and need for musicologists, historians, neuroscientists, psychologists and others to examine these theoretical issues together in order to move towards an understanding of musical experience that incorporates a sense of both the cultural and historical construction and the scientific materialist basis of musical experience.

The chapters in this book thus critically consider the basis of thinking on the topic, while also investigating the different models of the interaction of body, mind and emotions, revealing ideologies that have a significant impact on the questions that scientific and psychological research asks today. The historical chapters allow an evaluation of the social and cultural contexts within which these models were conceived as true, universal and scientific, drawing on the so-called method of reflexivity (common in ethnographic studies and in medical humanities) in which the subject of study is investigated alongside its practical and ideological contexts and frameworks which include the investigator and the common assumptions of the "normal" setting for the investigation (Bleakley, 2014; Viney, Callard & Wood, 2015; Whitehead, Woods, Atkinson, Macnaughton & Richards, 2016). Stepping beyond these boundaries will be essential in order to formulate approaches that help us to develop our understanding of the musical experience as a vital human phenomenon that manifests itself both as subjective experience in everyday life and as a scientific object of study.

The Basic Concepts: Music, Mind and Well-being

The concept of music itself as it surfaces throughout the chapters in this book requires some consideration. Interestingly, many a-historical studies appear to reveal a reliance on what musicologists have long since defined as a strong work concept. The underlying assumptions prevalent here follow a subject-object model in which music as an entity in itself impacts on the human mind and the aim is to quantify this impact. Yet, this very notion of music as possessing an objective character – and one that can be described both technically and aesthetically independent of an individual's reception and perception – has come under considerable scrutiny over the past 30 years, as musicology has tried to free itself from an ideological construct that determined its rise as a discipline in the first place (Bergeron & Bohlman, 1992; Clarke & Cook, 2004; Cook & Everist, 1999; Kerman, 1985; Kramer, 1990; see also Schatzki, Knorr-Cetina & von Savigny, 2001). The long-held idea that music operates as a series of fixed art works was critiqued comprehensively in the 1990s (Goehr, 1992) and the construct has come to be seen as a restrictive cultural premise, albeit one with continuing influence among composers, performers, theorists and educators. Ideas of music as practice ("musicking") as something one does rather than a collection of works has become increasingly influential in musicology (Small, 1998), but some other fields seem more beholden to older conceptions of music as an object.

This older concept of a musical "work" itself developed from the re-definition of music as an art in the late seventeenth and early eighteenth centuries or even as early as the Italian Renaissance (Kristeller, 1990) and from the subsequent desire to define and control music's powerful physical

and mental stimulation (Barker-Benfield, 1992; Goehr, 1992; Marsh, 2013). One Baroque source that strongly contributed towards this view of music as discrete works created by composers with a view to move the passions was Athanasius Kircher's highly influential treatise *Musurgia Universalis* (Rome 1650) (*Universal Music-making*). As well as classifying music and musical instruments Kircher's encyclopaedic work also contained a section on anatomy that included illustrations designed to show how the ear actually hears and responds to music (See front cover, also Gouk, 2001). For Enlightenment music theorists such as Johann Georg Sulzer, music's non-conceptual nature and its perceived physical and mental effects made it difficult to define it as a true art. Art's role was the moral education of man, a tall task for an un-texted piece of music, the meaning of which appeared potentially different to each listener. Two features of music became significant in defining music's inherent powers and its usefulness in the process of education: the manner of experiencing music – i.e. music as a practice – and a contemplation of music as abstract form. While both were part of the formulation of music's powers during the eighteenth century, the latter rose to prominence towards century's end, with a Kantian separation of experience and perception from the object per se (Bowie, 2007; Dahlhaus, 1981; Michaelis, 1806). Around 1800 an Idealist conception of music came to dominate, suggesting that music as practice and its physiological impact were mere tools towards the true aim of music – metaphysical truth communicated through musical form (Evan Bonds, 2009). Aesthetic judgement, therefore, was divorced from musical practice and the idea of music as aesthetic objects or works came to be tied to educational ideals in which art could further man's moral sense and be part of a moral education through its truth and beauty (Gramit, 2002; Riley, 2004; Semi, 2012); the physical effect of music was in part marginalised as a medical problem (Kennaway, 2012).

With this Idealist shift, abstract form not physical impact became the manifestation of music's vital powers. As a result, both music's formal parameters and its constituent parts – sound and vibration – took centre stage in treatises that were no longer instructive (as eighteenth-century composition treatises had been) but analytical. They displayed the desire to put understandings of music's impact onto a proper scientific basis. The novelist Stendhal reflected on this scene when he wrote in his 1824 *Life of Rossini* that, "Music is still awaiting the coming of its Lavoisier, the genius who will eventually submit the whole system of the aural nerves and indeed the human heart itself, to a series of accurate scientific tests and experiments." This person would need a "remarkably sensitive nervous system" to understand the kinds of "emotional reaction" provoked by music, leading in the end to "the establishment of a scientific theory of music based upon the observed data of emotional psychology (European sub-species) and upon an analysis of the habitual reactions of the aural nerves" (Stendhal, 1824, pp. 124, 125).

On the other hand, a generation later the music critic Eduard Hanslick postulated a view of music that was entirely divorced from such emotional psychology. In *Vom musikalisch Schönen* (1854) he denied music any expression beyond the expression of itself. As such, he distanced music from the expression of emotion to conclude that music's effects stemmed from the fact that its dynamism mimicked the shape of emotion rather than any act of expression. Hanslick claimed that form itself and the beauty arising from form was the only true essence of art. Here, aesthetic judgment was strictly separated from emotion, effect, perception and stimulation. At the same time, Hermann Helmholtz would attempt to provide a scientific rationale for music's effects on human physiology (1863). His definition of science and physiology necessarily required him to explain music's effects as entirely independent of any subjective perception. The development of his theory, however, was driven by his own strong emotional reactions – caused in turn by moral beliefs and national sentiment – against the virtuosic musical display which became increasingly popular during the nineteenth century (Hui, 2013; Steege, 2012).

Both Helmholtz and Hanslick would prove hugely influential on an understanding of music that isolated objects from practice. For both, musical practice and any effect arising from the application

or experience of music were pale shadows of music's true nature. One result of this was the prioritisation of the act of serious listening over any other ways of engaging with music (Hui, 2013; Rehding, 2003; Steinberg, 2006). Echoing Greek thought, Sulzer had already suggested that the ear and the eye were the primary senses with which man gained knowledge and honed his inner sense of the beautiful and the good and he also conceded that while "in these two noble senses lie the mainsprings of rational and moral behaviour," that "of the two, hearing has by far the greater power" (Sulzer, 1792, III, p. 421). Listening itself came to be formulated in such a way that only proper listening would yield the higher truth that the new metaphysics of music promised. The resulting prominence of listening over other modes of engaging with music is reflected in the familiar image of a modern concert culture which was established in the mid-nineteenth century. True art music must be revered in silence so as to unfold its powers (Evan Bonds, 2009; Johnson, 1995).

The idea of the work concept remains latent in much recent research into music's emotional and health effects. The reasons for this may be rooted in the fact that the move towards a music conceived of existing in and of itself and venerated through listening foreshadowed the interest in and the scientific means to record music (see Di Bona in this *Companion*) and that recorded music has become by far the most pervasive mode of engaging with music in Western society today. The one exception is perhaps singing, yet, everyday practices such as singing or humming to oneself have rarely been taken into consideration as musical acts in music-emotion-health studies. Many studies continue to rely on investigative approaches that prioritise listening over other modes of engagement and on a conception of music as a series of works with parameters that can be analysed and defined in rhythmic, melodic, harmonic and timbral features (Fritz et al., 2009; Gabrielsson, 2010; Juslin, 1997, 2013a, 2013b; Spitzer, 2009).

Music as practice is more commonly discussed in studies that deal with either therapy or community music making than in the "hard sciences" (Juslin & Sloboda, 2010; Macdonald et al., 2012). While Christopher Small introduced the concept of "musicking" as musical acts that cut across different modes of engaging with music, the boundaries between theory and practice and between music as works and music as application are at times still upheld in scientific studies into music's effects today (see Ilaria, and Hara & DeNora in this *Companion*). Still, in the modern era music therapy, for instance, has often been – and remains – an "other" to high art music and its effects.

The application of music in therapy and in education is often treated as entirely different to contemplation of music at a concert (for a breakdown of this dichotomy through education theory see Henley in this *Companion*). In short, music's therapeutic and its moral/educational values have been severed. The separation between aesthetic object and application can also be seen in the social psychology of music (Hallam, Cross & Thaut, 2009; Honing, 2018; McDermott & Hauser, 2005), with a split between studies that foreground agency and those that see the individual as a passive recipient. Here, the effects of musical activities on individuals in both clinical and non-clinical settings are now being studied on a large scale. These approaches place emphasis on variables including historical, cultural, psychological, physiological and behavioural effects which may have implications for health and well-being, but they view music as a tool and music-making essentially in terms of application studies. Indeed, these studies often function as validation for further scientific research into music, emotions and well-being. Only in recent work has this division begun to be resolved, significantly, perhaps, in approaches in education that draw on Small's work (Van der Schyff, 2015).

The concept of emotions, which forms a pillar of contemporary research into music and the brain, has also been shown to be highly historically contingent by scholarship in the booming field of the history of emotions over the past 20 years, notably in Thomas Dixon's important work on the development of the modern language of emotions as bodily, non-cognitive and involuntary, and on what was lost with the decline of the terminology of passions, appetites, affections and

sentiments (Dixon, 2003; Nussbaum, 2001; Plamper, 2015; Reddy, 2001). A sophisticated understanding of our concepts of emotions as in part historically contingent can enrich contemporary studies. Adding the issue of music to the consideration of the history of emotions raises further innumerable historical and philosophical questions about the nature of emotions themselves, the concept of "musical emotions," its influence on health and well-being and its uses in investigating human nature across history (Cochrane, Fantini & Scherer, 2013; Gouk, 2013; Gouk & Hills, 2005; Horden, 2000; Kümmel, 1977; Prins, 2014; Semi, 2012).

In music psychology, the concept of Basic Emotion Theory (BET) has recently been critically reviewed (van der Schyff & Schiavio, 2017). BET was adopted from psychology generally fairly recently into music and emotion research and has yielded significant work (Juslin 1997, 2013a, 2013b; Lundqvist, Carlsson, Hilmersson & Juslin, 2008), but the need to account for both aesthetic categories of emotions such as astonishment and awe, the demand for emotional categories that can answer to the contextual situatedness of musical emotions and the fact that they do not correspond necessarily to emotions created by other stimuli has led to a variety of other models of emotion. Some have abandoned the basic emotion model altogether and have described music as "complex information processing components" thereby shifting the onus firmly onto the cognitive faculties (Huron, 2006; Scherer & Coutinho, 2014); others have been critical of the stimulus model due to its focus on the act of subjective listening to objective environmental influences by which it uphold the subject-object divide, arguing instead that this does not account for the embodied experience of music (Koelsch, 2013; Krueger, 2013; Schiavio, van der Schyff, Cespedes-Guevara & Reybrouck, 2016). More recently, BET has been challenged by Dynamical System Theory so as to account for the experience of musical emotions as they unfold across body and mind in different contexts. Here, agency is given to the emotion itself (Clarke, 2005; Krueger, 2014; Van der Schyff, 2017; see Hara & DeNora in this *Companion*).

Another crucial concept implicit in many discussions of the topic is that of "human nature." In the first section of the *Companion*, contributors deal with a wide variety of implied models for conceiving of mankind since Antiquity, reflecting the fact that human nature is not a universal beyond history but something that is in part determined by social and cultural factors and by hegemonic systems of knowledge (Smith, 2007, pp. 16–61). As many of the chapters here reflect, discussions of music, both in the past and today, are often revealing about how human nature and its relationship to well-being are conceptualised. In the early modern period, new ideals of humanity were often expressed in terms of music and its relationship to sociability and natural law (Outram, 2013, pp. 99–113). With the development of sciences such as psychology from the nineteenth century, human nature was increasingly subject to systematic and experimental approaches (see Quiñones in this *Companion*).

The focus of our *Companion* on the relationship between music and the mind inevitably raises issues of embodiment and the "hard problem" of consciousness. Many of the chapters here set out views of the experience of music that assumes not only that listeners are "human animals" responding to stimuli, but also beings with will and agency, embedded in a specific culture. Different conceptions of the "self" involved in music are set out in our volume. So for instance, we see a neuroscientific embodied self (in the chapters by Fancourt; Heggli, Kringelbach & Vuust; Eerola: and Taruffi & Koelsch), an interpersonal self (in those by Thormählen; Ilari; and Hara & DeNora), a self defined by narratives and personal memories (see Hallam's chapter) and a spiritual self as "soul" in some of the historical chapters (see chapters by Pelosi; Hicks; Prins; & Gouk).

Finally, the modern concept of well-being is, of course, also a socio-historical construct. In the context of theories of happiness and human flourishing that have been profoundly influential since Antiquity, this concept still informs some contemporary approaches to music and the field of the "philosophy of life" in general (Bok, 2010). In other ways it is a rather recent concept, a response to a number of issues, such as the problem of how to define the concept of "health" beyond the

narrow sense of freedom from diagnosed pathologies. Since the World Health Organisation defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1946), well-being has encompassed a wide variety of social, personal and economic aspects. It is an attempt to create a measuring tool for individual perceptions of a state of contentment that is not directly dependent on actual physical health defined by the workings of the mechanical body. The result is a culturally determined concept of psychological well-being dependent on emotional states, which requires a search for measurable biological markers to serve as proxies for those emotions. Current pressures on health systems have led to a rise in the attention given to research into mental health, while the perceived pressures of an increasingly technologised and monitored lifestyle have given rise to a whole industry of alternative paths to "well-being," many of which relate to or use music in some form.

Structure of the Book

Historical Scientific Perspectives

The first section of the *Companion* presents historical chapters that investigate different moments of conceptualising music's relationship to emotion, mind and well-being. However, they don't constitute a neat teleology culminating in present-day conceptions of music's relationship to emotions and its usefulness as a tool for achieving well-being. Instead, they present paradigmatic moments of what theorists in the medical humanities have recently termed "entanglements" (Barad, 2007; Callard, 2016). They reveal that contemporaneous scientific perspectives and socio-cultural perceptions interacted in complex ways that do not allow a simple cause-effect understanding of their relationship in which one is merely handmaiden to the other.

This part of the *Companion* begins with Francesco Pelosi's chapter, which considers the range of ideas on the subject in ancient Greek sources. It demonstrates important ways in which Greek concepts of music and soul have informed subsequent thinking until today while outlining ways in which they differed crucially from twenty-first-century understandings. Pelosi gives a systematic overview of the major Greek schools of thought on the impact of music on the mind, health and well-being, including the Pythagoreans, the ethos school represented in particular by Plato and those who rejected the whole idea of music having a significant impact on body or soul. Furthermore, this chapter draws a distinction between implicit ideas about the long- and short-term impact of music to elucidate the relationship between medical, magical, religious and ethical conceptions of music, the body and the soul, thereby opening a debate that is still current today.

The following chapter, by Andrew Hicks, considers what happened to these Greek ideas as they were developed in parallel discourses in the Latin West, the Arabic and the Persian-speaking worlds during the Middle Ages. In particular, Neoplatonic theories of music in terms of the relationship between macrocosm and microcosm had a longstanding impact, notably among medieval Latin commentators such as William of Conches and Bernardus Silvestris, who drew strongly on Boethius's sixth-century AD *De institutione musica*. His version of theories linking music (*musica instrumentalis*) to the balance in man (*musica humana*) provided a context for understanding the physical, medical and ethical power of music with respect to bringing the soul into a state of harmony. In investigating the Arabic tradition, Hicks looks at texts such as the tenth-century *Epistles of the Brethren of Purity*, which considered the spiritual substance of music and its effects on its human souls in terms of the macrocosm. Similarly, writers in the Persian Sufi tradition also drew on Pythagorean ideas, but with more focus on the "ear of the soul" and the "ear of the heart" than on mathematical *ratio*. All the case studies here demonstrate that music's moral, emotional and physiological effects continued to fascinate medieval writers on music, but also that they all remained rather inconcrete with respect to specific ways in which music yielded such powers.

Jacomien Prins' chapter describes a move towards the conception of music as an art, displayed here through the examination of Girolamo Cardano's 1561 *De utilitate ex adversis capienda* (*On gaining advantage from misfortunes*) and the secular model of psychology which he sets out. Here, the Platonic idea that music can shape and condition the human soul experienced a revival, as Cardano argued for music therapy as an alternative to traditional religious ideas of the care of the soul, re-conceptualising musical practices of healing and education. At the centre of Renaissance theories of auditory perception and sensory cognition lies the concept of mental representation, because most operations of the mind were understood as a process of creating visual and aural images. The process of creating mental images of musical sounds was also associated with the arousal and control of the "passions of the soul." The chapter demonstrates how a new view of the pursuit of happiness came into being, focused on the manipulation of mental images using certain kinds of music. Cardano and his detractors set out the Idealist and naturalistic positions on the alleged power of music that have recurred in the debate ever since.

The focus shifts to England in Penelope Gouk's chapter, which considers the debate on music's effects in the late sixteenth- and early seventeenth-century, with particular reference to the composer and lutenist John Dowland. Despite the crisis in musical life brought on by the Reformation, books such as the anonymous 1586 *The praise of musick*, Mulcaster's 1581 *Positions* and Case's 1588 *Apologia musices* stoutly defended the art and explored how it was experienced. Gouk examines the language of passions and affections that framed understandings of music's effects, looking in particular at how these theories of music as a means of both relieving sorrow and intensifying enjoyable sadness related to the contemporary culture of melancholy expressed through music. Melancholy while being a "passion" also had a cognitive dimension, since spirits connected the body to the mind and soul. In this regard, Dowland continued a learned tradition that provided a vocabulary to articulate musical experience and offered an understanding of how music contributes to well-being. His singling out of a particular emotional state in the individual finds a counterpart in recent research into the perception of particular music as characteristic of a particular emotional state.

Eighteenth-century thinking on musical emotions in the context of new instruments such as Benjamin Franklin's glass armonica and Peter Joseph Schneider's aeolodicon is the subject of Carmel Raz and Stanley Finger's chapter. Franklin himself had tried to cure the Polish aristocrat Isabela Czartoryska of melancholy using his armonica. Similarly, Peter Joseph Schneider, author of *System einer medizinischen Musik* (1835), used music to try to cure a melancholy woman using an aeolodicon, an instrument with a keyboard and metal wind pipes. The debate on the medical impact of such instruments illuminates many of the major themes of this book, throwing into relief both the rationalisation of music via particular man-made instruments and via specific fixed parameters such as melody, harmony and rhythm. Significant here is the fact that timbre was crucial in music's effect, a musical parameter that is far less frequently considered in music-psychology in the twentieth and twenty-first centuries. The chapter also deals with the significant separation between music as social act and as aesthetic experience that arose from the recasting of music as part of a discourse on the arts in the second half of the eighteenth century, a dichotomy that we still grapple with today.

In Chapter seven Wiebke Thormählen explores how the aesthetic paradigm of music in early nineteenth-century England led to a division of the musical experience. Listening to music and making music were systematically framed as relating to separate types of experiences: the one aesthetic, the other social and educational. Physical and emotional effects of music, therefore, depended on these changing social functions. Large-scale amateur choral singing – a (semi-)secularised version of Christian church singing, with its ideologies of respectability, education and moral self-improvement – was born of the desire for a collective achievement that could aid the establishment of one's identity as an individual and as a member of a group. The emotions inspired through collective singing became drivers for the desire to affirm agency and establish a voice. Singing was

incorporated into discussions of health, yet resisted the increasingly dominant German Idealist aesthetics of music and social stratification. This historical framework reveals striking similarities with the results of recent scientific research into the impact of choral singing; here, the desire for collectivity and community emerges as the central theme that defines a perception of well-being.

Andrea Korenjak moves the historical focus onto nineteenth-century Austria in her chapter on music therapy, emotions and the mind in lunatic asylums. She looks at the work of Bruno Goergen (1777–1842), who in 1819 founded the first private "lunatic sanatorium" in Vienna, in which the famous poet Nicolaus Lenau was a patient. Goergen set up a large salon for musical performances, arguing that music was "one of the best psychic remedies." Yet, the chapter argues, music as a therapeutic aid was mainly considered a means for distraction, engagement and amusement. Theories of music's powers focusing on its beneficial distracting effects were drawn from clinical practice and reflected in the first Viennese medical dissertations on music. This chapter demonstrates that the evidence that music can distract the listener and performer possibly through inducing a state of "flow" – and in doing so can provide health benefits – is partly historical in character.

James Kennaway uses the famous late nineteenth-century clinical case of "Anna O." as a frame for an examination of shifts in thinking on music, the body and the emotions. Anna O. was a Viennese woman whose neuroses were discussed by Freud and his colleague Josef Breuer in one of the most famous studies in psychoanalysis. Although her neurotic symptoms were in part triggered by dance music, very little attention has been paid to this angle. In a vital shift, Freud and Breuer challenged the model that suggested that physical over-stimulation by music could lead to psychological symptoms, arguing instead that psychological causes could lead to physical symptoms. In the last 30 years, however, the pendulum has swung decisively back towards a neuroscientific model of music's effects. A clear understanding of this previous moment in the history of the topic should perhaps also lead us to question some of the technological determinism and whiggish assumptions about scientific progress that abound in our current neurological turn.

Marta García Quiñones' chapter follows this by investigating the development of music psychology in America in the first half of the twentieth century. Drawing on the earlier German experimental psychology of figures such as Wilhelm Wundt, the Americans Carl Seashore, Max Schoen and Walter Van Dyke Bingham built up the psychology of music as a sub-discipline to main-stream psychology yet one that enjoyed strong institutional support. Although introspection was one of the methods used, they showed little interest in the Freudian ideas examined by Kennaway. And while a neurological angle can be seen in the contemporary work of Wever and Bray on the auditory nerves, the principal methods of the period involved technological advances and new statistical techniques. The chapter takes as a starting point the collection *The effects of music* (Schoen, 1927), which illustrates some of the experimental procedures that were developed at the time and the key role of the phonograph in them. The latter is significant in two ways here: first, Quiñones identifies a crucial shift at this time from a focus on active engagement with music (bourgeois models of playing or Hanslickian "structural listening") to a consumption of music (facilitated by the phonograph) for health benefits, in line with stimulation models of music's effects. Second, the role of technological means strengthened the stimulation model of music in both aesthetic theories and in therapeutic and educational music practices: based in contemporary medical practices, music here was seen to affect mood (in a return to ideas of nervous stimulation), rather than to express it.

Juliane Brauer's chapter takes up Thormählen's narrative of music as a social praxis. Looking at music in Germany in the first weeks of the First World War, in the Sachsenhausen concentration camp and in the Soviet-occupied zone of Germany after the Second World War, it defines music-making as an emotional praxis that offers an explanation for the close relationship of music and emotion via action and agency. Brauer uses the Scheer model to conceptualise listening as a bodily practice that allows for "doing" rather than feeling emotions, re-conceptualising musical emotions

not merely as perceived emotions from which one can choose to step back if they become unpleasant but as tools that can be used as torture. Far beyond the chain of music–mind–emotion–biological marker, this chapter frames the power of context that puts a significant rift between the perceived emotion and the resulting biological reactions.

Contemporary Scientific Perspectives

The second section of the *Companion* looks at a wide variety of contemporary scientific perspectives on issues related to music, emotions, the brain and well-being. Together, these chapters reveal the wide-ranging concern in many different disciplines with music's powers today. In her introduction to the current debate on the relationship between music and emotion, Elvira di Bona provides a consideration of the theoretical and epistemological problems that lie behind the debate around music, mind and well-being. She offers an introduction into the role of emotion as a distinctive aspect of musical experience. Drawing on her background in philosophy and cognitive science, she provides a view of the most important explanations for music's power to arouse, resemble or express emotions. She sets out the "quarrel" between musical "cognitivists" and "emotivists" whether the emotional content of the music resides somehow in the music itself or in the listener and the views of formalists in the tradition of Hanslick who reject the focus on emotions in music altogether (Zangwill, 2004). These continuing philosophical debates about fundamental questions in the relationship between music and feelings still pose an implicit challenge to many researchers in disciplines based on more direct conceptions of the music-mind-emotion-well-being nexus.

The next chapter, by Daisy Fancourt, examines the biological mechanisms at work below the level of our psychological responses to music. In an environment where the prestige of neuroscience has led to a widespread belief that "you are your brain," she expands the focus to other parts of the body that also have the ability to affect the function of the mind. Her chapter considers not only how musical emotions can trigger physical changes in terms of factors such as hormones and neurotransmitters, but also how those changes in turn feed back to the brain. The long and short-term effects on mood that these changes can cause has implications for inflammatory immune responses as well as for affective phenomena such as stress and depression. The chapter goes on to examine recent thinking on the evolutionary roots of emotional reactions to music in terms of the immune system and the hormonal basis of social cohesion, and it concludes with a look ahead to future understandings of the relationship between music, subjective emotion, limbic activity and health. As such, the chapter forms the counterpart to Di Bona's philosophical chapter by arguing that analysis of the wider biological foundations of the music-mind-body-emotions complex can provide us with a better understanding of the relationship between music, emotions and well-being.

Alexandra Lamont's chapter sets out the current state of the debate in her field of psychology and the legacy of Positivist experimental approaches since the 1950s. She outlines the various conceptual models that dominate the discussion of music's impact. Lamont goes on to discuss such models in the light of critical social psychology and up-to-date empirical findings to illuminate how and why music creates emotions, taking into account social context as well as the experience of individual musical "stimulation." Her chapter also considers psychological insights into the question of happiness and well-being with reference to Seligman's PERMA model (2002), which has strong echoes in thinking since Antiquity, as the historical chapters in this *Companion* show. The model is often applied to help people develop new cognitive and emotional tools and its scientific underpinnings remain the subject of current debate, especially with respect to the reconciliation of its philosophical and biological foundations. Lamont also examines the specific nature of playing as opposed to just listening to music, and explores questions of social identity tied up with different modes of engagement, echoing Thormählen's work on the nineteenth century. She concludes with

some thoughts on the kinds of views of music and emotion that we would have if music's meaning as well as its stimulating power were taken into account.

For a contrasting view, we turn directly to the neuroscience of music and current thinking on what it can tell us about musical emotions. Ole Heggli, Peter Vuust and Morten Kringelbach's chapter takes one of the central concerns of contemporary research on music, emotion and the brain – the role of pleasure. They discuss the links between subjective feeling and objective measurable reactions in the brain, revealed by modern neuroimaging techniques, showing the ways that musical experience fits into broader patterns of pleasure in the brain. They argue that music is a ubiquitous source of what is perhaps a pleasure only available to humans. Like any other reward, music can lead to subjective feelings and objective hedonic reactions as part of complex emotional responses. Finally, the chapter examines a particular phenomenon, "chills," and the role of anticipation as well as the relationship between pleasure and broader conceptions of well-being, suggesting that music's pleasure relies on predictive mechanisms which the neuroscientific method can reveal. As a hypothetical application study, the authors consider the potential of music in the treatment of anhedonia (a lack of pleasure) in certain affective disorders.

To address the challenges presented by the stimulation/pleasure model of music and the brain, the next two chapters consider the apparently paradoxical issue of sad music, albeit in two very different ways. Tuomas Eerola sets out the main controversies in explaining why people enjoy melancholy music, considering its effects along conceptually different yet interconnected domains: physiology, psychology and phenomenology. Considering the idea of sad music, apparently non-utilitarian in two senses, both ostensibly negative and "merely" aesthetic, allows Eerola to question the paradoxes of aesthetic emotions. The solution presented to the paradox of sad music is a subtle view of the "trajectories of emotional experiences" in listening to music that work at a number of conceptual levels each with its own mechanism.

The second chapter to examine the issue of sad emotions in music from a neuroscience angle is written by Liila Taruffi and Stefan Koelsch. It begins by looking at historical explanations for the appeal of sad music, from Aristotle's notion of catharsis to the work of Levinson and what they can bring to current debates, which often lack this broader approach. The chapter continues with a cross-disciplinary approach combining philosophical and psychological perspectives with neuroimaging to make sense of the observation that although sadness is typically described as a negative emotion, in aesthetic contexts it is paradoxically associated with pleasurable experiences. To conclude, the authors consider the strengths and weakness of the whole neuroscientific approach to music in a way that goes beyond the reward-circuit model.

These chapters combine the so-called "cognitive turn" in research into the relationship between music, cognition and emotion and the more recent "affective turn," in which the focus shifted from musical cognition to affective musical phenomena (Thompson, 2017). The cognitive approach sought answers to the question of why many people attach importance to their musical experiences in terms of cognitive functions such as perception and memory as well as attention and listener expectation. Moreover, the way in which the listener plays an *active* role in the creation of a musical experience that can be exhilarating, soothing and inspiring had become a focal point of studies in the field of music cognition. Underlying this approach is the idea that listening does not happen in the outer world of audible sound, but in the inner world of our minds and brains.

The challenges of the "affective turn" and the related new avenues of music research are discussed in Ariadne Loutrari and Marjorie Lorch's chapter. Their work looks at what we can learn from the parallels between the role of features such as pitch, loudness, duration and phrasing in the expression and perception of emotion in speech and music. Parallels between music and language (especially rhetoric) have been a recurring aspect of conceptions of music and emotion since Antiquity, as the historical chapters in this *Companion* reflect and in the past 20 years they have been

a significant theme in neuroscience (Patel, 2008). Loutrari and Lorch argue for a focus on prosodic features of music ("expressiveness") in neuroscientific research into music and emotion, and for their position in discussions of various forms of cognitive impairment. In line with several other chapters, they also draw attention to the challenge of the tension between the attempt to construct empirically testable universals to explain music's emotional impact and the role of cultural context.

Beatriz Ilari's chapter engages with the debate on music, emotions and well-being by looking at musical engagement and well-being in the first 8 years of life. She argues that all young children need experiences of individual and collective well-being to establish a healthy self-image, and she examines the role that music can play in this. Her discussion uses the model set out by Roberts (2010) to assess the value of "musicking" in early years for four vital stages of identity formation: physical development, communication, identity and boundaries (i.e. social grouping) and agency (related to will and emotion), before outlining a number of studies to show how "musicking" affects these developments at different levels of social interaction (micro, meso, exo and macro). While the studies predominantly show that musicking is a useful tool for developing and maintaining a sense of well-being, she points to the problem that social conditioning has not been taken into account in the studies insofar as all of them mainly deal with people with WEIRD backgrounds (i.e. white, educated, industrialised, rich and democratic).

Jennie Henley's chapter investigates the claims made for music's power to achieve well-being by focusing on the relationship between music, emotion and learning. She challenges the view that the links between musical development and emotional development lie solely in the *content* of music learning. Her chapter critiques the notion that emotional development occurs as a result of engagement with emotional content embedded within music and suggests that it is not the type of music or musical activity that is learned; rather it is the manner in which music is learned that gives rise to emotional development. She examines the relationship between music and emotion in the context of music education. As she points out, the rationales for teaching music, from art-for-art's sake to ones based on its extra-musical benefits, often assume a powerful emotional impact, but this is rarely consciously acknowledged in music policy in education. Drawing on her work with the Good Vibrations music programme for hard-to-reach audiences, including people in prison, Henley considers the potential role of music in reflection and conflict resolution.

The final two chapters present questions related to the role of music and emotions among older people. Susan Hallam's chapter looks at the scientific research into the impact of music in the lives of the elderly, both those with full cognitive function and those with diminished powers. It argues that music can be equally important in maintaining and realising a sense of well-being in the ageing. Like several other chapters, notably Thormählen's, it looks specifically at the effect of acquiring skills in playing music, not just listening to it. In particular, it draws on studies relating to the British Music for Life project, looking at ways in which learning music was linked to well-being as it enhances the perception of autonomy and control, positive social relationships, competence and a feeling of accomplishment.

Mariko Hara and Tia De Nora's chapter also looks at older people's relationship to music. It offers an examination of the long-term benefits of music for Alzheimer's patients, not as a technology or a temporal stimulus "dose," but as something "ecological," embedded into social practice. Drawing on ethnographic techniques, they look at music as an activity, not a reified concept, opening up new methodological angles that could prove highly productive for the debate on music, emotions and well-being more broadly. They observe that although dementia is a long-term process, current literature on music in dementia care tends to focus on the immediate effects of music, in contrast to the authors' longitudinal ethnographic case study. By presenting this material the authors aim at making a case for ecological perspectives in order to highlight the ways in which music offers more sustained benefits.

Concluding Remarks

The beginning of the twenty-first century is an exciting time for research on music, mind and well-being. While human experiences are necessarily interdisciplinary and require multi-faceted and at times perhaps contradicting approaches, we are hopefully moving forward towards a more comprehensive dialogue between disciplines about music's relationship to the mind. However, rather than positing unified new knowledge or universal truths about the relationship of music, mind, emotion and well-being, we hope that this *Companion* inspires further historical and scientific investigation into music or musicking as everyday experiences, its ideological models, its ecologies and its modes of engagement and communication.

Placing historical, sociological, psychological and neurological approaches into a continuum, the chapters reveal many common strands: investigations into aesthetic experience, aesthetic attitude and their relationship to the mind, emotions and to ways of listening (DiBona, Lamont, Thormählen, Eerola, Quiñones), questions of the relationship of mind and body and the concept of embodiment (Pelosi; Prins; Brauer; Heggli, Kringelbach & Vuust; Henley; Hara & DeNora; Ilari); questions around happiness, well-being and pleasure circuits (Prins; Lamont; Taruffi & Koelsch; Hallam; Heggli, Kringelbach & Vuust); and questions of the way in which we have and continue to construct the relationship between music, mental states and healing on one hand and morality, education and self-improvement on the other (Kennaway; Hicks; Korenjak; Fancourt; Gouk; Loutrari & Lorch; Raz & Finger). These intersections reveal that concepts of music and understandings of the self, of body, mind, emotion, perception and experience influence each other to form questions and approaches to the topic in which these ideas are inextricably linked and in which each one can be turned into the justification for the other. As such, philosophical and aesthetic approaches are not simply "useful" to medical or scientific explanations; rather, "humanist" and scientific models have to a large extent determined each other. Historical hindsight, perhaps, can reveal this entanglement more clearly than contemporary studies can, by showing for instance both the impact of medical and scientific thinking on musical aesthetics since Antiquity, as well as highlighting the role of culturally and historically determined concepts and frameworks in scientific understandings of music.

Together, the chapters also demonstrate that while the interest in music in terms of feeling and mental states appears to be universal throughout Western history, music's power is far from universally applicable. While recent scientific approaches account for the cultural conditioning of music's effects in individual experiments, generalised notions of "music" and its parameters as internal attributes that make music stand in opposition to the individual and act upon her/him from the outside are still widespread. The stimulation model of music as object in psychological and neurological discussions remains strong. The emerging field of musical neuroaesthetics is particularly liable to this problem (Hjortkjaer, 2013; Zeki, 2008), sometimes seeming to portray music as *acting on* the individual in an automatic fashion, without much consideration of the role of the active listener. The idea of music as a practice is only slowly gaining momentum in the way that current research asks its questions and is methodologically conducted. The separation of studies that foreground agency and those that see the individual as a passive recipient is strong; the separation of subject and object is upheld and the ideology of the work concept, of moral education and the primary place of listening are latent in many studies into music's effects. This has allowed researchers and practitioners to reformulate music therapy and music-making as modes of intervention that mimic commonly accepted and practiced models of "clinical intervention" thereby upholding the concept of the medical intervention as the primary path towards healing.

Ultimately, this *Companion* was produced with the aim of revealing and questioning some of these ideologies in the belief that the development of approaches to mind and well-being can be furthered by continued cross-fertilisation between disciplines. We hope to encourage future researchers to consider the ideological frameworks that exist particularly around the question what music is and what a musical experience is.

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SECTION ONE

From Antiquity to the Twentieth Century

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2

MUSIC, MIND AND WELL-BEING IN ANTIQUITY[1]

Francesco Pelosi

Introduction

The belief that music has a strong connection to human life, touching both soul and body, was widespread in ancient Greek culture. An emblematic example is provided by an anecdote of Pythagoras preventing a drunken youth from setting fire to the house of a rival in love by asking the musician to change the musical style (Iamblichus's *De Vita Pythagorica, On the Pythagorean life*, 112). As we shall see, this story, together with other evidence, suggests that ancient thought on music was deeply imbued with the idea that this art can contribute to the restoration of health and psychological balance. Literary and iconographical sources are full of references to the power of music and its manifold uses as a means of promoting health and well-being in people's personal lives and in their social and political communities.

Several ancient Greek philosophers emphasised music's moral force in the education of the soul and in shaping a person's behaviour. This set of ideas is usually referred to as the "*ēthos* theory of music," where "*ēthos*" stresses the effect of music on character and "theory" refers to the conceptualisation effort made to describe the impact of music on human behaviour (Abert, 1899; Anderson, 1966; Kramarz, 2016; Lippman, 1963; Rossi, 2000). However, it is essential not to overlook the religious and mythological background that gave rise to this intellectual enterprise, as well as the complexity of ancient Greek thought on music, which is multifaceted and not a single univocal theory. Even though the many reflections on the power of music in these sources share common ideas, they provide a variety of responses to the fundamental issues raised by the impact of music. In order to understand and describe the effect of music on the human mind and body, ancient Greek thinkers formulated different views of music and its expressive properties, as well as of the psychophysical elements involved in musical experiences. Attempts to conceptualise the relationship between music and man led, on the one hand, to sophisticated reflections on the expressiveness of music (described, for example, in terms of *mimēsis*) and, on the other, to efforts to define how musical experiences are processed in terms of cognitive processes and human physiology.

Interestingly, many of the questions addressed by ancient Greek thinkers concerned with music and its effects are still at the core of the debate on music's effects today. In fact, one might say that modern debates on the topic are deeply rooted in ancient Greek ideas and their enduring reception – a crucial point seldom acknowledged in contemporary publications on the topic. In particular, the shared fascination of both ancient and modern thinkers for music's impact is expressed in theories about the specific characteristics of musical language, the physiological and psychological

processes involved in the act of listening and in thinking about the way that musical experiences are capable of furthering health and well-being. (For some references to ancient Greek theories in the contemporary debate on music, see Hamilton (2009); Cook & Dibben (2010, pp. 46–47). For a multidisciplinary approach to the effects of music, bringing together historical perspectives – and specifically some important references to the ancient Greek thought on music – and contributions from the fields of psychology, neuroscience and musicology, see Cochrane, Fantini & Scherer (2013)).

Despite these similarities between ancient and modern research on the power of music, their crucial differences need to be addressed first in order to avoid misleading comparisons. The ancient Greek equivalents of the terms "music" and "mind" are respectively *mousikē* and *psychē*, but they do not match exactly the corresponding modern terms. *Mousikē* (an adjective that implies *technē*, literally "the art of the Muses") often covers a wider semantic range than our concept of "music," including poetry and dance as well as instrumental music. At the same time, since there is no specific term to indicate instrumental music, *mousikē* can also mean "music" in the modern sense (expressions such as "harmony and rhythm" – *harmonia kai rhythmos* – are also used to indicate instrumental music). As regards *psychē*, the semantic richness of this term includes particular functions and notions that we are used to consider as characteristics of mental life: i.e., perception (or, better, the co-ordination and processing of the stimuli provided by sense-perception), feeling, emotion, will, judgement, cognition and reasoning. Among the various meanings listed in the reference Greek-English lexicon by Liddell-Scott-Jones under the entry *psychē* we find: "the *conscious self* or *personality* as centre of emotions, desires and affections," which may therefore be best described by the contemporary term "mind." However, one should not forget that *psychē* means primarily "vital breath" and "principle of life and movement," whence the most common translation, "soul." In this chapter I will use "music"/"*mousikē*" and mind/soul quite freely, but I will focus on the instrumental part of *mousikē* (leaving the verbal and choreutic components in the background) and on its relationship to the *psychē* as the seat of moral dispositions, emotional states and cognitive processes. Some terminological clarifications are also required with regard to the impact of music on emotions. As the historical research on emotions has documented, "emotion" is a relatively recent word, which came into common usage during the eighteenth and nineteenth centuries to replace terms such as "passions" and "affections" (Dixon, 2003, pp. 1–25). In ancient Greek sources, the closest term to describe the concept of "emotion" is *pathos* (pl. *pathē*, from *paschō*, "to suffer" – which is commonly used to define reactions such as anger, fear and joy; however, *pathos* is also used, more generally, to describe what it is that affects someone or something or the quality of a thing (Konstan, 2006, pp. 1–40). On the other hand, Greek writers used a vast array of terms to describe and analyse what we would call emotional responses. In the light of these terminological remarks, I will use the modern term "emotion" as a broad category, while attempting to be as precise as possible in identifying the psychophysical processes described in these theories.

Given the tendency in ancient Greek writings to acknowledge and explore the power of music, virtually all the passages dealing with this art have a bearing on the question of the impact of music on people's mind and well-being. In this chapter I shall address the principal theories in order to give a clear idea of how music's influence was conceptualised in ancient Greece. As I shall argue, this conceptualisation touched some key aspects of ancient Greek culture, from magic, medicine and religion to some central areas of philosophical thought such as ethics, psychology and epistemology, and comprised fundamental contributions from various approaches to musical phenomena, including disbelieving views of the powers of music. For the sake of clarity, I will draw a general distinction between two ways of conceptualising the impact of music. In the first part, I will examine the theories that deal with the notion of a long-term effect of music: i.e., the influence that music exerts *over time*. This kind of impact is often centre stage in a theory when an author wants to focus on music's power to condition morals and behaviour. In the second part,

the focus will be on those theories characterised by an emphasis on music's short-term effect: that is, the *immediate* impact of music on either the body or the soul; interest in this impact particularly characterises reflections on the therapeutic use of music. It is worth pointing out that such a sharp distinction is not made explicit in the ancient sources, in which these issues are always dealt with together. However, making a distinction between a short-term and a long-term impact will help the modern reader understand the different aspects of these theories. In particular, such a distinction will make it clearer that ancient theories on music as an educational and political tool were underpinned by sophisticated analyses of the link between the psychological processes underlying the acquisition of habits and the repeated exposure to a particular kind of music. Moreover, through this distinction the interplay can be highlighted between music, medicine, magic and religion, which lies at the very heart of the notion of music as a remedy for physical and mental illnesses.

The chapter opens with an analysis of Plato's seminal reflection on music and its powers, which set the agenda for later analyses of this topic, broaching some fundamental issues for the first time. Subsequently, Aristotle's discussion of similar questions as addressed in his *Politics* will be analysed. The second part of the chapter introduces some sources on the use of music as a therapeutic tool by highlighting how the notion of music therapy hinges on the idea that music can promote an immediate change in man's psychic or bodily constitution. Lastly, against the mainstream opinion that music has a massive impact on human life, some ancient theories firmly deny the ethical and emotional effects of music. A brief paragraph at the end of the chapter is devoted to these eccentric positions, whose drastic limitation of the powers of music provides a challenging perspective on the ancient debate on music and its effects.

"A Healthy Place": How Music Shapes a Good Society

Plato's project of a state music as expressed in his *Republic* is one of the most fascinating attempts in Western thought to draw on music for political purposes (a modern variation on this view being changed into a dystopian one is given in Brauer's chapter in this *Companion* at pp. 16–18) and the most famous analysis of music in Plato's works (not to say in ancient Greek philosophy as a whole). Along with the extensive investigation of musical topics in Plato's last work, the *Laws*, it provides the first sustained analysis of the power of music, aimed at controlling and manipulating this art for educational, social and political purposes. In the first books of the *Republic* and in the *Laws* (especially books two and seven) Plato outlines two educational programmes – respectively addressed to the guardians, i.e. the most important class of the city envisioned in the *Republic* (Kallipolis) and to the whole citizen body of the society outlined in the *Laws* (Magnesia) – that are designed to shape the morals of its inhabitants by conditioning the basic feelings of pleasure and pain, as well as the emotions.

The backbone of these educational programmes consists of two fundamental tenets that lie at the core of Plato's thought on ethics and music. First, the idea that, at an elementary level, the process through which a moral sense begins to take shape does not depend on reason: even if one's intellectual faculties are not fully developed, it is possible to behave virtuously by acquiring certain habits in the soul; second, music has the power to express moral content and instill it in the soul without involving reason, by exerting a huge influence on both the mechanism of sense-perception and the passions of the soul involved in it. It is precisely because music is capable of reaching this non-rational dimension and attuning it to reason that it plays a leading role in education, especially when education cannot count on a fully developed reason. This effect manifests itself, for example, in the upbringing of young guardians in the first books of the *Republic* and in the life-long education of the whole citizen body in the *Laws*, whereas in the *Republic* book seven a higher *paideutic* use of music (as harmonics), involving the intellect, is conceived (Pelosi, 2010, pp. 14–67, 114–151). In order to create this psychic harmony, music must exert a repeated influence so as to accustom the

individual to having the right emotional and ethical responses: in other words, music educates by means of "habits," as is clearly stated when, in the seventh book, Plato describes its usefulness within a basic education, before claiming its inadequacy in a higher educational programme, where intellectual faculties play a primary role (*Republic* 522a–b).

In Plato's *Republic* 401b–c, the cultural environment created by artists whose work conforms to the principles laid down by the founders of the *polis* is described as "a healthy place" (*hygieinos topos*), echoing the medical language of the Hippocratic *On Airs, Waters and Places*, for instance (Gastaldi, 2013, pp. 46–47). Expanding on this metaphor, Plato goes on to describe the impact of these works of art on youths as a wholesome breath that reaches their eyes and ears, subtly leading them to behave in harmony with reason. Music provides a decisive contribution to the creation of this salubrious place, as is shown by the great attention that Plato pays to musical matters when outlining his political project. Thus, it comes as no surprise that, at the moment of explaining how the arts lead the souls of the youths to virtue, Plato deals only with music: harmony and rhythm, we are told, train us to distinguish the ugly and shameful things (*aischra*) from the beautiful ones and to have the right emotional reactions; that is, to "feel dislike rightly" (*orthōs dyscherainōn*) for the former and to "take delight" (*chairōn*) in the latter, so as to behave appropriately even in the absence of a fully developed rationality (*Republic* 401d4–402a4).

The strong effects of music on the passions of the soul and character referred to in this passage hark back to the detailed treatment of *mousikē* in the first books of the dialogue (2–3). At *Republic* 398d–400c Plato scrutinises the strictly musical component of *mousikē*, that is harmony and rhythm (the verbal part having been explored in the previous pages) and makes a limited selection of the *harmoniai* [melodic structures constituted by different patterns of intervals and called by ethnic names: Dorian, Phrygian and Lydian (Barker, 1984, pp. 163–168; West 1992, pp. 177–189)], instruments and rhythms to be admitted in Kallipolis. The criterion for the selection is entirely extra-musical, as it were: the musical elements are accepted or refuted only on the basis of the emotional or ethical content they convey. It is essential, at this point, to mention the theory of the expressive properties of music that underlies Plato's view, as well as other ancient perspectives marked by the idea that music exerts a great influence on character: according to Plato, music can represent ethical dispositions and emotional states by means of specific mimetic qualities and impress them upon the soul. It is worth pointing out that Plato attributes mimetic properties to *mousikē* as a whole, but also specifically to its strictly musical component, which is said to have the power to reproduce ethical and psychological qualities by its expressive means – that is, rhythm and melody, leaving aside words – and to make the soul acquire them (Pelosi, 2010, pp. 59–67).

An example of Plato's view on the communicative properties of the music *stricto sensu* is his selection of *harmoniai* at *Republic* 398d-399c: the "dirge *harmoniai*," as well as the *harmoniai* that inspire shameful behaviour, such as drunkenness, softness and idleness, are rejected, while the Dorian and the Phrygian *harmoniai*, whose ethical content is considered to be respectively courage and temperance, are admitted into the educational programme for the guardians. As this discussion on *harmoniai* clearly shows, melodic structures are considered able to convey (and impress upon the listener's soul) a vast array of moral dispositions and moods. Although the focus of the passage is on virtue, the role of the emotions cannot be underestimated: for instance, the virtue that the Dorian *harmonia* contributes to enhance, i.e. courage, implies a correct relationship with the emotion of fear (*phobos*), as well as with other passions, such as pleasure (*hēdonē*), pain (*lypē*) and desire (*epithymia*), as is clear from the treatment of this virtue in book 4 (*Republic* 429c–430b). To summarise, in these pages of the *Republic* music is conceived as a powerful means to manipulate emotions, within an educational project that is essentially based on this manipulation, as the key to shaping an individual's character and bringing the lower impulses of the soul into agreement with reason. According to the refined psychological, ethical and political theory featured in the *Republic*, music plays a crucial

role because it promotes a shared morality and emotional dimension (at least within the class of the guardians), which is essential in order to build and maintain the good order of the city.

Even more explicitly, in the *Laws* music is designed to harmonise (*symphōnēsōsi . . . symphōnia*) feelings and emotions such as pleasure, pain, love and hate with reason, as it is through these fundamental reactions that virtue and vice first reach the soul (*Laws*, 653a–c). Analogously to the *Republic*, the *Laws* highlights that this musical training to develop appropriate emotional reactions does not involve reason, but rather occurs through habit (*Laws*, 653b5–6: *eithisthai . . . ethōn*). More than in the *Republic*, though, Plato recognises the importance of pleasure in this process: the musical representations (*mimēmata*) of virtuous models must be perceived as pleasant; therefore, a training of musical taste is needed, so as to accustom one to have the appropriate hedonistic response to music, according to the ethical content it conveys. It is worth noting that, in focusing on musical pleasure, Plato pays attention to one of the most basic psychophysical reactions to music, which are unanimously acknowledged in ancient sources: interestingly, it is acknowledged by both those who stress the moral function of music (such as Plato and Aristotle) and those who deny its ethical influence (such as Philodemus of Gadara, discussed below) (see Halliwell, 2002, pp. 250–3; Jones, 2012; Peponi, 2012; Rocconi, 2012). The special attention to the attractive power of music that Plato pays in the *Laws* also emerges from a notion that is repeatedly associated with music in this dialogue: the concept of *epōidē*. The term, which literally means "a song sung to/over" someone or something, namely an "enchantment," and which evokes a complex interplay of music, magic and medicine is widely exploited throughout the *Laws* where, with a play on words, chants (*ōidai*) are defined as enchantments (*epōidai*) and musical education is conceived as an operation of social incantation (*Laws*, 659e–660a). Nevertheless, while the assimilation of songs to magic spells powerfully expresses the charming and compelling force of music (Pelosi, 2010, ibid. pp. 26–28), it hardly accounts for the way in which Plato actually conceives this power.

Despite the fact that he extensively investigates this topic both in the *Republic* and the *Laws* and conducts further investigations of music in other dialogues (e.g., in the *Timaeus*), nowhere in his work is Plato explicit about the process by which music expresses ethical dispositions and an emotional content, nor on the way it impresses these upon the soul. However, one aspect emerges plainly from his consideration of the impact of music: the effect that in the *Republic* and the *Laws* is envisaged as the result of an appropriate musical education comes from repeated exposure to certain kinds of music–whence the need for a strict political regulation of the musical culture. The musical conditioning of taste and emotion and consequently of morality, is a process that occurs over time. The need for the songs to be laws – that is, the need to carefully preserve the musical style which has been accurately selected for educational purposes – is expressed several times in the *Laws*, where Plato plays on the double meaning of *nomos* as "law" and "song" (*Laws* 722d, 734e, 799e) and in more controversial and challenging terms in the *Republic* 424c: this emphasis can be explained by considering the importance of time with respect to the effect of music contemplated in these works. To be sure, this perspective on the influence of music may imply a consideration of the immediate effects that a piece of music has (e.g., the immediate reaction to a Dorian *harmonia*), but the effect Plato is interested in here is the result of repeatedly experiencing certain kinds of music, since music can only mould people's character through this long-term action. As regards emotions in particular, musical education in this perspective does not (or not only) aim to arouse the right emotional responses, but seeks to create a stable emotional sphere that can provide a solid basis for ethical behaviour, as is clear from the description of how education inspires courage, by fostering a right relationship with the emotion of fear in the guardians' soul. Significantly, this conditioning of the emotion of fear, whose ethical result is courage, is described as an indelible dye that tinges the soul and makes it acquire a "belief" (*doxa*) (429c–430b). If and to what extent the inner disposition produced by musical education is stable is a related question about which Plato

keeps thinking until the *Laws*, where the project of a life-long musical (re)education seems to suggest that there is a risk of the dye impressed by music being washed out.

Plato's approach to musical phenomena is embraced by Aristotle (384–322 BC), who in his turn conceives an educational role for music in the political framework outlined in the *Politics*, setting out from the assumption that education must be ruled by laws and that music can contribute to educational ends. However, in comparison with Plato's view (especially as laid out in the *Republic*), there is one feature of Aristotle's discussion of music in *Politics* 8 that stands out as different: the educational role of music, with which Plato is almost exclusively concerned, is but one of music's functions in Aristotle's discussion. As we are told in *Politics* 1339b10–14 and 1341b36–41 music can be used for education (*paideia*), but also for amusement (*paidia*), leisure (*diagōgē*) and catharsis [on these functions, in particular on leisure and its relationship with education, see most recently Destrée (2018)]. By contemplating music's different purposes, Aristotle's reflection provides new insights into the study of how music affects morality and passions, particularly through his treatment of the interplay between ethics, emotions and music and his specific account of tragic emotions.

In arguing for the influence of music on character, in extensive parts of *Politics* 8 Aristotle stresses both the involvement of emotions and the role played by habit in education imparted by means of music. The crucial role of habit first emerges at 1338b4–5, where Aristotle points out that "education by habit must come before education by reason," and later on at 1339a24–25, when he focuses on music by introducing the idea that it is "capable of producing a certain quality of character . . . accustoming (*ethizousan*) men to be able to rejoice (*chairein*) rightly" (transl. Rackham, 1932). Moreover, the emotional and hedonistic component of this ethical training, hinted at in this passage by the reference to a correct way of taking pleasure in something, is clearly affirmed when Aristotle gets to the heart of the discussion on music: virtue, which music contributes to promote, consists in delighting, loving and hating in the right way (*Politics*, 1340a14–18). As in Plato's thought, the link between music and virtue is provided by a strong conviction that music can represents ethical dispositions and emotions (Halliwell, 2002, pp. 158–164, 237–249). At 1340a18–21 Aristotle observes that rhythms and melodies bear likenesses (*homoiōmata*) to anger (*orgē*), mildness (*praotēs*), courage (*andreia*) and temperance (*sōphrosynē*), as well as "all their opposites and the other moral qualities (*ēthika*)." Note that, along with courage and temperance, a pair of terms famously singled out by Plato in *Republic* 3 as paradigmatic virtues expressed by music, two emotions are explicitly indicated as the content of musical *mimēsis* (anger and mildness) although their status as emotions is not stressed in the passage, as they are apparently listed under the label of moral qualities (*ēthika*, Brüllmann, 2013).

The impact of music on the soul is specifically conceived in these passages as an effect on *ēthos*, designed to promote the *ēthikē aretē*, "ethical virtue" (Woerther, 2008, pp. 98–9). In this perspective, the emphasis on emotion and habit as essential components of the process through which music affects the soul is perfectly intelligible, for both emotion and habit are essential to Aristotle's definition of ethical virtue, which is described as a disposition (*hexis*), acquired by means of habits, to feel emotions in an appropriate way (*Nicomachean Ethics*, 1103a17–18, 1105b25–28, *Eudemian Ethics*, 1220a38–b3). Analogously to Plato and with a stronger emphasis on the interplay between emotions, habit and music, Aristotle conceived the influence of music on character, within the framework of an educational use of music, as a process that occurs over time and is based on a reiterated exposure to certain melodies.

Nonetheless, Aristotle's broader perspective on musical phenomena takes into account not just the long-term effects of music, but also its immediate influence: while the latter is mainly explored in the discussion of the educational role of music, which takes up large sections of *Politics* 8, the former emerges when Aristotle takes into account the direct impact of music on the audience, that is an occasional response to a single musical event. The analyses of the two effects are not clearly distinguished: Aristotle intersperses his discussion of the educational impact of music on children's

character with remarks on the immediate effect of music on the listener. This is the case at *Politics* 1340a12–13, where he describes the sympathetic experience of feeling emotions that are analogous to the ones represented by music or at *Politics* 1340a22–23, where he observes that listening to music promotes a change in our soul (*metaballomen gar tēn psychēn*). The psychological modification referred to here is a direct effect, not the gradual change that leads to a permanent disposition (Heat, 2001, p. 15; Jones, 2012, pp. 168–169): the former is, so to speak, a necessary but not sufficient condition for acquiring the latter.

The analysis of the cathartic function of music at *Politics* 1341b32–1342a15 provides another interesting case (perhaps the most renowned one) of Aristotle's interest in the direct impact of music in *Politics* 8 (on modern scientific views of musical catharsis, see Eerola's chapter in this *Companion*). Having distinguished the melodies into ethical (*ēthika*), practical (*praktika*) and enthusiastic (*enthousiastika*), Aristotle goes on to say that emotions like pity (*eleos*), fear (*phobos*) and enthusiasm (*enthousiasmos*) are felt by everybody, although not to the same degree and that those who are particularly liable to be possessed by enthusiasm are restored to their good condition by melodies that lead their soul to frenzy, as if they had received a medical treatment (*iatreia*) and a purification (catharsis); analogously, all those who feel pity, fear and other passions can experience a pleasurable relief (*kouphisesthai meth' hēdonēs*) from emotions and a sort of catharsis. As is well known, this is the only description of musical catharsis in all of Aristotle's work: the *Poetics*, which this part of the *Politics* refers to for a more detailed treatment of the topic, does not specifically address the cathartic function of music, nor does it expand on cathartic processes in general, but it only succinctly affirms the cathartic role of tragedy in relation to fear and pity (*Poetics*, 1449b24–28). Therefore, many points remain opaque and open to discussion. It remains a matter of debate, for example, whether the cathartic process in Aristotle's thought amounts to a homeopathic remedy – whereby the emotions conveyed by art are similar to the emotions to be treated – or whether, on the contrary, catharsis works as an allopathic treatment, whereby artistic emotions act on opposite emotions. (On Aristotle's theory of catharsis, see Belfiore (1992, esp. pp. 260–291, 320–326); Destrée (2011); Munteanu (2012, pp. 238–250); Heat (2001); Lear (1992); Ford (2004); Rapp (2015, pp. 445–451). In this *Companion*, the topic of the pleasurable emotions aroused by distressing music is explored by Taruffi & Koelsch) However, some characteristics of the musical catharsis described in *Politics* 8 can be confidently established. First, the very notion of catharsis (as with terms such as *iatreia* and *kouphisesthai*, clearly borrowed from the medical field), evokes a link between music and medicine that is deeply rooted in religious lore and practices and integrated into philosophical discussions. Second and most importantly, catharsis implies a direct effect of music, which operates as a medical remedy by purifying the emotions of the listener the very moment it reaches him. Aristotle's theory of catharsis leads us to the topic of the therapeutic use of music.

Music Therapy at the Crossroads of Medicine and Magic

The idea that music can treat physical illness, modify pathological mental conditions and provide relief from negative emotions emerges at the very outset of ancient Greek literature: significantly, it is attested in some passages of the Homeric poems, which describe the therapeutic uses of music for the healing of the body and the soothing of the soul [For example in the *Odyssey* 19.455–458, the blood gushing from Odysseus's wound is stopped by a magic chant (*epōidē*) sung by Autolycus's sons; at *Iliad* 9.182–188 Achilles calms himself by playing the *phorminx* (a stringed instrument), while at *Iliad* 1.472–4, Apollo's wrath is eased by paeans. See Provenza (2016, pp. 32, 49–50 n. 30, 79–86)]. In this idea a widespread notion of the power of music merges with religious and magical beliefs: when it comes to musical remedies, a number of sources (including those Homeric passages) mention the paean – that is, a ritual song often addressed to Apollo (significantly, the god who

presides over both music and medicine) – and the *epōidē*, the sung spell which combined words and music to produce a coercive effect and which later found a place in philosophical texts, as we have seen with reference to Plato's *Laws*. Admittedly, the part played by music in healing through incantation must have been relatively modest, since the *epōidē* was more akin to a ritual lullaby or magic spell than a song (Rocconi, 2001, pp. 283–285; West, 2000, p. 54). Still, on the one hand, the very notion of *epōidē* is closely associated with music and the musical overtones of this remedy are evident in the accounts of treatments by means of enchantments, as well as in the philosophical use of the notion; on the other hand, besides the phenomenon of the *epōidē*, therapeutic power is explicitly ascribed to music. From the fifth century BC onward, healing incantations, as well as other forms of musical and magical remedies, began to be criticised by physicians and contrasted to medical approaches to illness (see the Hippocratic treatise *The Sacred Disease* 1 and Sophocles's *Ajax* 581–582). However, they continued to play a part, no matter how ambiguous, in the treatment of both psychic and physical ailments.

Among early considerations of music as a potential therapeutic agent, Pythagoreanism stands out, since it is credited with theories and practices in this as well as other fields related to music. However, while the Pythagoreans' contributions to harmonics and acoustics are well attested and recognised as pioneering research within ancient Greek natural philosophy, their thought on the ethical, psychological and therapeutic effects of music is more controversial (Provenza, 2012). In asking whether and to what extent the Pythagoreans were committed to the use of music for therapeutic purposes, we are compelled to deal with a major problem in the reconstruction of Pythagoreanism: the reliability of the sources, which are often much later than the theories and the events they report. The Pythagorean use of music as a means of treatment is chiefly attested by two Neoplatonic works – Porphyry's *Vita Pythagorae* (*Life of Pythagoras*, third century AD) and Iamblichus's *De vita Pythagorica* (*On the Pythagorean Life*, third–fourth century AD) – whose tendency to interpret the figure of Pythagoras in the light of Platonism has been clearly detected and analysed (O'Meara, 1989). In addition to these two works, it is worth considering an earlier piece of evidence, which is highly interesting for its chronological and spatial proximity to the Pythagorean circle: a fragment from Aristoxenus's lost work on the Pythagorean life [fourth century BC, fragment 26 from Wehrli's (1945) collection]. Regardless of the reliability of all these sources as witnesses to actual Pythagorean theories and practices – not to say the teachings of Pythagoras himself – they throw some light on the strong interest in the therapeutic power of music throughout Antiquity, across different philosophical traditions: the Peripatetic (and Pythagorean) *milieu* that shaped Aristoxenus's education and the Neoplatonic background from which Porphyry's and Iamblichus's accounts emerge (Provenza, 2012; Sheppard, 2005).

These sources provide an account of a systematic use of music as a therapy, designed to purify the soul and restore a psychophysical balance. Aristoxenus (fr. 26) reports that the Pythagoreans practiced the purification (*katharsei echrōnto*) of the body by means of medicine (*dia tēs iatrikēs*) and that of the soul (*tēs psychēs*) through music (*dia tēs mousikēs*). However brief, this evidence shares some significant points with other descriptions of the therapeutic use of music: first, the medical operations and the musical ones are presented as two complementary and somewhat similar practices, insofar as both produce a sort of purification; what distinguishes the two is the object of the intervention: the body or the soul. As Provenza (2012) has pointed out, the psychophysical treatment described here through the notion of catharsis may well be understood within the frame of the ritual and religious use of music as a means of healing and purification, already attested in archaic literature. The distinction between body and soul raises a number of issues that can only partially be addressed here. Interestingly, the distinction also appears in Porphyry's evidence on Pythagoras's music therapy, albeit in slightly different terms. At *Life of Pythagoras* 30 Pythagoras is said to enchant psychic and bodily affections (*ta psychika pathē kai ta sōmatika*) by means of rhythms, melodies and incantations (*rhythmois kai melesi kai epōidais*). With further details, at *Life of Pythagoras* 33 Pythagoras is described

as curing those afflicted by physical or psychic diseases, by means of incantations, magic and music (*epōidais kai mageiais . . . mousikēi*): he used melodies (*melē*) that cured illnesses of the body, when sung over (*epaidōn*) the sick and melodies to forget sorrow, soothe anger and remove unsuitable desires. The distinction of body and soul is not accompanied here by the limiting of the musical treatment to the psychic dimension. The idea that music also has a therapeutic impact on the body is widely attested in Antiquity: from the belief that music cures sciatica or assuages the pain it causes, attributed to Theophrastus (c. 371–287 BC, fragments 726A-C in Fortenbaugh, Huby, Sharples & Gutas (1992)), to the idea that music can treat the consequences of snakebites (pseudo-Democritus = Bolus of Mendes, Diels, Kranz, 68B 300.7, third century BC) and the reference to the curing of deafness through trumpet-blasts, attributed to the physician Asclepiades of Bithynia (first century BC, Martianus Capella, 9.926).

To come back to the Pythagorean use of music for therapeutic purposes, Iamblichus's work on the Pythagorean life provides the most detailed account. At *On the Pythagorean Life* 64 and 110–115 he says that Pythagoras was able to change psychic *pathē* such as sorrow, anger, pity, jealousy, fear and desires into their opposites, by employing a wise selection and combination of the appropriate melodies, rhythms and instruments. The "medical" use of music (melodies are compared to drugs) to condition human emotions is presented as a daily therapy, useful when rising in the morning and at the end of the day, to promote a good night's rest and prophetic dreams, by purifying the soul of the turmoil of the day.

The term catharsis, used to define the impact of music on the soul and the emphasis on the transformation of emotions into opposite moods, suggest that the effect of music is conceived neither as a restraint on emotions nor as their eradication, but rather as a significant change of the emotional drives at the basis of behaviour. This is confirmed by the famous anecdote that was highlighted at the beginning of this chapter, a version of which Iamblichus relates at *On the Pythagorean Life* 112. The story goes that Pythagoras was able to calm a drunken youth who was about to set fire to the house of his rival in love because of his emotional condition and the additional excitement provided by a Phrygian melody, played by an aulete; Pythagoras made the *aulos*-player change the music to a spondaic melody (a libation tune), which brought about an immediate change in the intoxicated youth, who regained control of himself. Two points are worth highlighting here. First, the change in music (from an exciting melody to a solemn one) causes an analogous change in emotions (from rage, *lyssa*, to composure, *kosmiōs*). Second, the effect of the music is immediate (*amellēti*) and limited to a particular emotional condition, just like a medical remedy whose efficacy is direct (Fortenbaugh, 2012). Again, what emerges here is the conception of an immediate impact of music, very different from the musical influence that results in a psychic and ethical disposition–an influence that hinges on the idea of a reiterated and prolonged exposure to a certain kind of music.

Both conceptions of the impact of music are combined in Aristides Quintilianus's *De musica* (*On Music*), an imposing musical treatise from the third or the fourth century AD. Here, many of the notions and themes characterising earlier musical speculations converge within the ambitious project of an all-embracing treatment of music as a technical, educational and cosmological matter. In the second book of his treatise, mainly devoted to the educational and therapeutic role of music, Aristides deals at length with its effect on emotions. In the wake of Plato and Aristotle and of other upholders of the *ēthos* theory, Aristides believes that music has an extraordinary impact on human beings and can be used to promote psycho-physical and moral amelioration. Delving into the topic of the emotional impact of music, he sets out by observing that music has proved to be an appropriate psychic therapy: by considering earlier practices in the musical field, Aristides points out that for each emotion "there was a fitting style (*harmottōn tropos*) of treatment through music (*dia mousikēs therapeias*), which brought the sufferer gradually and without knowledge, into a proper condition (*es orthēn katastasin*)" (transl. Barker, 1989). The principles of music therapy are laid down:

"music is a treatment for the passions of the soul" (*pathōn psychikōn hē mousikē therapeia*, 66.2–3). Before exploring the nature of the emotions on which music is supposed to operate and the way in which this intervention occurs, Aristides draws an interesting distinction with regard to the impact of music on character (68.22–28). Ethical *paideia* – he says – is twofold: we have therapeutic *paideia* (*therapeutikon*), through which we correct vice and beneficial *paideia* (*ōphelētikon*), which is further divided into a strengthening of the best disposition and a supplementation, i.e., a gradual increasing of virtue. The therapeutic part too is further divided into two different parts: "amelioration" (*meiōtikon*), that is the action by which we "diminish little by little an emotion that we cannot persuade all at once (*peithein athroōs*), to the point where it is no longer felt (*es apatheian*)"; and "eradication" (*anairetikon*), which consists in accomplishing "a complete transformation in the hearer from the start." This passage presents interesting distinctions between the various ways in which music influences human character and emotions, by considering, *inter alia*, the difference between short-term and long-term impact.

Aristides allows for the use of various kinds of music: as he argues (82.1–3), while manliness and decorous melodies are necessary for education, those of the other type are needed for other ways of leading the soul (*psychagōgia*). In the same chapter (80.10–22), he gives an example of how the considerable therapeutic potential of music might be exploited. *Harmoniai* can be applied to each soul either "according to similarity" (*kath' homoiotēta*) or "according to dissimilarity" (*kat' enantiotēta*); in both ways, however, we "disclose (*ekkalyptō*) the bad character that lurks within it." If the psychic disposition is "obscure and hard to diagnose" (*adēlon kai dysgnōston*), Aristides suggests that we apply whatever melody is at hand and observe its effects: if the melody succeeds in producing the desired change, it must be further used in the treatment, but if the soul remains unaltered, a modulation must be introduced. Thus, music turns out to be not only a therapeutic tool, but also and foremost, a diagnostic instrument. In conceiving this sort of experimental music therapy based on trial and error, Aristides has clearly in mind the practice of medicine, as it emerges from 85.28–30, where a comparison with physicians is drawn: "a wise doctor does not always give the strongest drugs but will respect the weakness of the patient's constitution." Analogously, the music therapist should measure out the musical elements and appropriately blend them together in order to achieve the required effect on the soul (85.21–86.7). (For the Renaissance revival of these kinds of ancient theories of music therapy, see Prins in this *Companion*).

On the Moral Insignificance of Music

Although the idea that music can make an important contribution to human well-being (by producing either short-term or long-term effects) was so widely accepted as to be a hallmark of the ancient thought on music, dissident voices were raised against this dominant conception. While they may be in the minority, these heterodox positions provide an essential piece for a full comprehension of the ancient debate on the expressive and emotional effects of music, as well as for a deep understanding of the continuity between ancient and modern attitudes to music and its power. It is worth mentioning that some scholars have compared the ancient disbelieving theories on the effects of music to the modern aesthetic approach called "formalism" (Abert, 1899, pp. 27–43; Halliwell, 2002, p. 256), because those theories recall to some extent the formalistic principle that the meaning of a musical piece lies entirely in the musical structure itself and does not refer to extra-musical content.

The earliest occurrence of the idea that music cannot affect character is contained in a large excerpt of a polemical speech, preserved in a papyrus (Papyrus Hibeh I 13) and probably composed in the early fourth century BC. The anonymous author criticises some self-styled *harmonikoi*, whose theories include the conviction that music has an impact on character. More specifically, the author attacks the idea that "some melodies make people self-disciplined (*enkratreis*), others prudent (*phronimous*),

others just (*dikaious*), others brave (*andreious*), and others cowardly (*deilous*), not understanding that the chromatic (*chrōma*) cannot make cowards nor the enharmonic (*harmonia*) make brave men of those who employ it" (Papyrus Hibeh I 13, ll. 13–7, transl. Barker, 1984). The essential features of the *ēthos* theory criticised by the author of the speech are clear from these lines: music can condition one's character, by instilling some moral qualities into it (such as justice, courage . . .) or their opposite (cowardice), in particular by means of its melodic genera (chromatic, enharmonic . . .). What proves far more difficult is reconstructing in detail, based on this concise criticism, the author's position against the *ēthos* theory. One point is clear, though: his criticism strikes at the heart of the moral view of music by denying that differences in the melodic structure of a piece cause different moral dispositions in the listeners.

To find a more extensive and articulate critique of the powers of music we have to wait until the first century BC. In his work *On music*, the Epicurean Philodemus of Gadara (110–35 BC) questions the power of music to affect character and hence its usefulness for educational purposes, by attacking in particular the ethical approach of the Stoic Diogenes of Babylon (c. 240–152 BC). (Another famous attack on the ethical influence of music is launched by the Sceptic Sextus Empiricus at end of the second century AD, in the sixth book of his work *Against the professors*).

At the basis of Philodemus's approach to music lies the idea (based on the Epicurean physics, theory on sense-perception and epistemology) that musical experiences are but stimulations of the sense of hearing; as such, they engender automatic responses which do not significantly vary among different hearers: in listening to a piece of music, everyone has the same perception and derives much the same pleasure. The alleged expressive ethical and emotional qualities of music do not belong to music in itself, but to the processing of the musical stimuli (coll. 115–117). Philodemus's view stands against the background of a sharp distinction between music and words, in relation both to their expressive qualities and their psychological impact: while words convey meanings and are capable of influencing human behaviour, music does not carry any real meaning, being completely non-rational (*alogos*) and incapable of expressing ethical content and impressing it upon one's character. Far from being morally significant, music can only arouse purely sensory and unnecessary pleasure (Delattre, 2001; Halliwell, 2002, pp. 249–259).

Thus, while the idea that music has a significant impact on human life was pervasive in Antiquity, it still underwent severe criticism. At least one of these critiques, that of Philodemus, went as far as to target both the expressiveness of music (that is, its capacity to convey extra-musical meanings) and its power to promote ethical ameliorations. This gives us a clear sense of how lively the ancient debate on music was and suggests that the dominant view on the powers of music refined and strengthened its arguments partly as a response to such criticisms. As we shall see in the following chapters, the legacy of the ancient believers in the impact of music on human life has been great and enduring, influencing later approaches to musical experiences and paving the way for further conceptions of the interplay between music, mind and well-being.

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3

THE REGULATIVE POWER OF THE HARMONY OF THE SPHERES IN MEDIEVAL LATIN, ARABIC AND PERSIAN SOURCES

Andrew Hicks

Introduction

In the dead of winter, a Satyr invited a nearly frozen traveller into his cosy cave. When the man blew upon his cold, stiff fingers and the Satyr asked why, he responded: to warm them up! When the man blew upon a hot bowl of porridge and the Satyr again asked why, he responded: to cool it down! Thereupon, the Satyr cast him out saying, "I cannot abide that he remain any longer in my home who can affect such diverse dual purposes with the same mouth!" (Avianus, 1934, no. 29.19–22). This ancient Aesopian tale (Fab. Aesop., 64), "The Satyr and the traveller," popularised by its inclusion in Erasmus's *Adagia* under the title "To blow hot and cold from the same mouth" (Erasmus, 1513, 1.8.30), provides a tidy analogue to a central problem in music's power over the human body and soul. The Satyr, frightened at the man's use of his breath for two purposes so wholly different, warming and cooling, attributes a dangerous character to such inconsistency. The same inconsistency can be and was many times charged against music's diverse and seemingly contradictory powers to induce ecstasy (or, we might say, warm the soul) and to calm frenzy (or cool the soul). To quote the Persian poet Rudaki (d. 941), from verses quoted by the Ikhwān al-Ṣafā', the plaintive cry of the *zīr* (the highest string on the lute) "now makes the madman (*dīwāneh*) sane (*hush-yār*), now upon the sane (*be-hosh-yār bar*) places the [madman's] chain (*zinjīr*)" (Ikhwān al-Ṣafā', 2010, p. 165, translation modified).

In this chapter, I provide three medieval cross-cultural case studies – Latin, Arabic and Persian – that acknowledge music's dangerous duality (or plurality) and provide intriguing variations on a shared strategy for the mitigation of its seemingly reckless powers and the strengthening of its therapeutic and cultivating force. While different cultures formulated a wide variety of strategies in different periods, many of which are outlined elsewhere in this *Companion*, in this chapter I focus on the variable interpretations applied to one particular strain of ancient speculation on music's power over the human constitution: the correspondence between the harmonic structure of the macrocosm (the world) and the microcosm (the human body and soul) via the regulative power of the harmony of the spheres (Hicks, 2017). (On the ancient Greek sources of this theory, see Pelosi in this *Companion*.)

The Pythagorean harmony of the spheres, however, did not come with a user manual, and ancient sources do not specify any single strategy for harnessing and exploiting its cross-cosmic resonances.

In late-antique Greek sources, such as Iamblichus's *On the Pythagorean Life* (fourth century AD) and Proclus's commentary on Plato's *Republic* (fifth century AD), we find the outlines of a comprehensive Pythagorean programme of "music therapy," extending from a therapy for the base passions through the senses to the cultivation of the rational soul through reason (O'Meara, 2005, 2007; Sheppard, 2005). But this line of therapeutic speculation did not have a direct influence on Western music theory until Marsilio Ficino and other Renaissance Neoplatonists in the fifteenth century deliberately revived this late-antique tradition (see Prins as well as Gouk in this *Companion*). Quasi-medicinal descriptions of music are occasionally found in Arabic traditions as well. For instance, in a thirteenth-century manuscript of the Ikhwān al-Ṣafā's *Epistle on Music* (my second case study), one reader summarises its contents as "a clarification that notes and rhythmical melodies have effects on the souls of listeners like those of medicine, potions and antidotes on the physical body" (Wright, 2008, p. 216). However, none of the three medieval case studies outlined in this chapter could be deemed a conscious programme of music therapy, *stricto sensu*. Instead, the trio is intended to provide a concise overview of the variability and flexibility of the harmony of the spheres and its role in the regulation of human experience (musical and moral), across its transcultural implementations. Each of the case studies puts pressure on a different variable, so to speak, in the cosmic mechanisms of music's power: (1) the harmonic structure of the soul, which guarantees an innate love of harmony; (2) the possibility that a properly constructed instrument can mediate and imitate cosmic harmony; and (3) the cultivation of a particular mode of listening, a philosophy of audition, that enables music's power and mitigates its potentially deleterious effects.

In the medieval Latin tradition, my first case study, here represented by Boethius's sixth-century *On the Fundamentals of Music* (which remained *the* primary textbook on music for at least a millennium) and the reception of Boethian ideas in twelfth-century cosmology, the primary focus is the first of these variables: the harmonic structure of the human soul, which has a natural inclination for harmonies akin to its original, well-tuned state, before it was knocked out of tune by conjunction with the body. Accordingly, twelfth-century cosmologists such as William of Conches and Bernard Silvestris worried little, at least explicitly, about the "wrong" type of music and instead focused their attention on the ability of music (and music theory) to be employed as a philosophical tool to strengthen the soul's natural inclinations and tame its baser urges. This line of speculation, however, did not explicitly proscribe or prescribe particular kinds of music or particular listening practices; nor did it formalise into a specific set of ritualised musical practices.

My second and third case studies centre upon a specific form of ritualised musical practice known in Arabic and Persian as *samā'* ("[spiritual] listening") (Avery, 2004; Lewisohn, 1997; Lucas, 2012). In the medieval Arabic tradition, the second case study, here represented by the tenth-century *Rasā'il Ikhwān al-Ṣafā'* (*Epistles of the Brethren of Purity)*, the primary concern is the spiritual substance (*jawāhir*) of music and its effects on its spiritual agents, the souls of its listeners, through the mediation of an instrument, the lute (*'ud*), created by sage-musicians precisely to harness the power and proportionality of the macrocosm and ensure its proper spiritual effects. Finally, in the medieval Persian tradition, the third case study, represented here by the poet Niẓāmī Ganjavī (d. 1209) and the twelfth-century Sufi philosopher Shihāb al-Dīn Suhrawardī (d. 1191), the primacy of proportionality, indeed the whole tradition of "mathematical" Pythagoreanism, is subordinated to a uniquely Persianate but still Pythagorean philosophy of audition centred upon the "ear of the soul" and the "ear of the heart" (the *gūsh-i jān* and *gūsh-i dil*).

Case Study One: Harmonies in Sound = Harmonies in Us

The introduction to Boethius's *Fundamentals of Music* stands as an elegant "praise of music" (*laus musicae*) that documents music's great power. With a rhetorical technique that we may aptly deem "shock and awe," Boethius marshals an astonishing array of ancient *testimonia* to music's power:

the arcane Lacedaemonian decree, in which the rabble-rouser Timotheus (450–360 BC) was censured for introducing immoderate and excessive "chromatic" melodies that threatened the very moderation of virtue; the mythic tales of ancient sages, such as Pythagoras and Empedocles, calming many a frenzied youth; the wondrous healing power of melody exploited by Terpander, Ismenias the Theban and Democritus over bodily ills exacerbated by disturbed states of mind. All of these are cited by Boethius (and repeated in the theoretical tradition for millennia to come) to attest the unique sway that music has over both soul and body. Hence Boethius's most famous claim: "Whence it is that, since there are four mathematical disciplines, the other three share with music the task of searching for truth; but music is associated not only with speculation but with morality as well" (Boethius, 1867, 1.1, p. 179.20–23). Boethius's introduction, then, is more than merely a *laus musicae*; it is also a powerful argument for the reality of the harmonic composition of cosmos, body and soul and the very real moral implications of musical practices. The many mythic, even anecdotal examples of music's power (therapeutic and corruptive) are wrapped in arguments that frame this musical ethics in terms of Boethius's own tripartition of music into (1) sounding music (*musica instrumentalis*); (2) human music (*musica humana*); and (3) cosmic music (*musica mundana*). Near the beginning of the prooemium (introduction), immediately following an approving glance at the *Timaeus* and its harmonious construction of the "World Soul" (*musica mundana*), Boethius suggests (entirely in line with *Timaeus* 47d2) that the harmonies in sound (*musica instrumentalis*) are akin to the harmonies in us (*musica humana*). When we hear melodies and are delighted by them, we can recognise that we too are composed in the same likeness (1.1, p. 180.5–9). Having established the basic principle that "likeness attracts, whereas unlikeness disgusts and repels" (1.1, p. 180.9–10), Boethius launches into many examples, including those mentioned above, before finally circling back again at the end of the introduction to remind us what his various stories prove *in toto*:

> But to what purpose are all these? So that there can be no doubt that the state of our soul and body seems to be composed, somehow, by the very same proportions that, as subsequent demonstrations will prove, join and unite harmonic melodies (*harmonicas modulationes*).
>
> (1.1, p. 186.8–10)

Twelfth-century readers of Boethius, who sought to apply his music theory to Platonic texts that offered similar arguments (including Plato, Macrobius and Martianus Capella), pushed this idea further. When William of Conches, in his philosophical dialogue, the *Dragmaticon*, from the mid-twelfth century, was asked to give a natural-philosophical account of the union (*coniunctio*) of body and soul – one that would go beyond the simple, obvious answer that God joins soul and body – he took recourse to the language of music:

> To every soul such a love of proportion and concord has been given by God that even in sounds, which are outside it, the soul deeply appreciates proportion and concord. And this is what Plato meant to say by mentioning that God constituted the soul from musical consonances. Now, human bodies are constituted from the four elements linked together proportionally and concordantly. This proportion and harmony attracts the soul, joins it to the body and retains it in the body. And if we were to speak truly and properly, we should say that the soul loves not the body, not its qualities, but proportion and concord by which the parts of the body are joined together. So the soul seeks whatever preserves that proportion and shuns whatever destroys it. But as soon as the elements begin to be at variance with one another, the soul shuns the body and separates itself from it.
>
> (William of Conches, 1997, 6.25.2–4)

The harmony of the body is the *conditio sine qua non* for the soul's existence in and conjunction to the body. The soul, in a manner of speaking, is an aesthete that takes pleasure in the well-tempered beauty of its body, just as it is attracted by the harmonies of sound. The body's concord seduces (*allicit*) the soul and keeps it embodied; the soul's innate love of concord compels it to maintain and moderate the body's proper elemental proportions, without which the soul-body conjunction cannot survive.

The soul's own harmonies, however, are attuned to a celestial exemplar. For instance, in a twelfth-century commentary ascribed to Bernard Silvestris on Martianus Capella's *On the Marriage of Philology and Mercury*, the harmony of the spheres becomes a celestial model for the soul's proper functioning, namely, the triumph of rule-bound reason over the wandering of erratic sensuality. This commentary reorders the Boethian tripartition of music and elevates *musica humana* (which the commentator associates with *intelligentia* or "understanding") above *musica mundana* (which the commentator associates with *ratio* or "reason") (Hicks, 2008). This reshuffling has further implications; the epistemological framework, the ascent from reason to understanding, necessitates that the harmony of the spheres, so often cast as the pinnacle of music theory, be subordinated to the *musica humana*. The commentator effects this subordination by developing an idiosyncratic and highly synthetic account of the harmony of the spheres. Bernard remains mute on most traditional topics pertaining to celestial harmony, offering no planetary scales, little in the way of celestial mechanics and only a brief explication of its inaudibility in the sublunar realm (Bernardus Silvestris, 1986, 3.76). But a curious etymological gloss on the Camenae, the Roman goddesses identified with the Greek muses, afforded him an opportunity to develop a celestial harmony in line with his epistemological framework. He begins traditionally enough, following Remigius of Auxerre in deriving Camena from "to sing beautifully" (*canere amoene*; cf. Lutz, 1962–1965, p. 67), but a quick consonantal shuffle suggests a second etymology: "*Camena* as if *canema*, that is, singing to the soul (*canens anime*)" (3.263–264). For this fanciful etymology, the commentator gives two rationales. The first explains "singing to the soul" as the performance of music when the soul separates from the body, a reference (presumably) to funereal practices (3.264–267). The second and more speculative explanation (3.267–287), echoing Macrobius's *Commentary on the Dream of Scipio* (2.3.4–6), posits the heavens' twin motions (*geminus motus*), the regular movement of the fixed stars and the erratic wandering of the planets, as a celestial song:

> But it is better that Camena sing to the soul in the heavens, when she joins together the courses of the planets and fixed stars. The soul has evidence of this, since it sees in the world a twin movement: one from the west to the east, which is called erratic because it ascends and descends [=the planets]; the other, which moves straight from the east to the west and then is carried back again to the east, is called rational because it is always uniform [=the fixed stars]. [. . .] Moreover, the soul sees in itself, like a rational motion, reason and like an erratic motion, sensuality. When it struggles to suppress sensuality with reason, it imitates the heavens. Diversity, uniting these motions, sings to the soul and in such a way teaches all things through these motions. Whence Plato says that God gave eyes to men for this reason, so that knowing the courses of the [divine] providence and mind that occur in the heavens, they might correct the erratic motions of their own mind.
>
> (Bernardus Silvestris, 1986, 3.267–287; compare *Timaeus* 47b)

The heavens' twin motions, which in their diversity sing to the soul, become the instrument of human self-preservation.

Later in the commentary, the harmony of the microcosm is linked directly to the influence of the celestial spheres and the cosmic elements. Commenting on a passage in which Martianus describes Psyche as the daughter of the Sun and Endelichia, Bernard seizes on the opportunity to

discuss the diversity of views about the generation of the soul (Martianus, 1983, 1.7, p. 4.10–12). Among those discussed is Plato's account of the creation of souls and the allotment of each soul to its own star (*Timaeus* 41de). Although Bernard insists that, if properly understood, Plato says nothing that would contradict Catholic doctrine, his interpretation of Plato's text goes so far as to claim that the soul *qua* soul ceases to exist upon the dissolution of the bodily harmony, and his remarks come very close to a quasi-functionalist account of the soul:

> From where else could cold come but the earth, water, the Moon, Mercury and Saturn, given that other worldly things do not have natural cold? Or from where could heat come save from Jupiter, fire, air, Mars, the Sun and Venus? The soul is equivalent (*compar*) to this proportion. When the concord of these is present in the body, the soul begins to exist, but when that concord is dissolved, the soul ceases to exist, not because that immortal substance itself ceases to exist, but that substance – although the soul always lives – is no longer a soul. For the soul is the name of a function (*officium*). And thus, when the duration of its animation is completed, it is no longer a soul.
>
> (Bernardus Silvestris, 1986, 6.533–542)

On this view, soul *qua* soul is necessarily embodied, for the soul *is* the animating (and harmonising) function (*officium*) that it exercises throughout the duration of its embodiment. This view, however, says nothing about sounding music's role in the regulation of this psychosomatic harmony. But an anonymous, late-twelfth-century commentary on Martianus, glossing the same passage of the *De nuptiis* (1.7), spells out the musical implications of the proportions that the stars grant to the body. These proportions are, in fact, bestowed by the harmony of the spheres in the soul's descent, which has direct implications for the human experience of sounding music.[1]

> From Saturn the soul accepts sadness, from Jupiter moderation, from Mars animosity, from Venus cupidity, from Mercury the possibility of interpreting, from the Sun heat and *aestheticon*, i.e., the power of sensation, from the Moon *phyticon*, which means growth. Whence Macrobius attests that, as [the soul] descends through these [celestial] spheres, in which consists the concord of celestial harmony, it pulls along with it certain musical consonances to the human body, by which it is suited to the body. When it sometimes hears these harmonies in instruments, it is delighted, as if reminded of the sweetness of the celestial harmony.
>
> (Hicks, 2017, pp. 148–149)

The sweet harmonies of instruments, like the harmony of the microcosmic body, echo the music of the celestial bodies, whose own harmonies affected the soul in its descent and allow for its temporal, embodied existence – its well-being, which is a state of harmony. But this twelfth-century tradition of philosophical speculation on the well-being of bodies and minds, a harmony both effected by and mimicked in the harmony of instruments and hymns that represent the diverse movements of the cosmos, did not, as noted in my introduction, coalesce into any ritualised musical practice with explicit prescriptions or proscriptions. Frustratingly, maddeningly, liberatingly, the twelfth-century musical cosmos refused to be concretised and pinned down to any specifics.

Case Study Two: Yearning to Ascend Through *Samāʿ* ("Spiritual Listening")

The performance of the "spiritual concert" or the act of "spiritual listening" – both encompassed by the term *samāʿ* – was a musical conduit through which the Sufis sought to elevate their human state from the "lowest of the low" (*asfal-i sāfilīn*) to the primordial perfection of the "best stature"

(*aḥsan-i taqwīm*) (Qur'an, Sur. 95.4–5). *Samā'* expresses "an attitude of reverent listening to music and/or the singing of mystical poetry," in order to arouse the listener to a spiritual state (*hāl*) or a state of spiritual ecstasy (*wajd*) (Lewisohn, 1997, p. 4; on *hāl* and *wajd* specifically, see Sells, 1996, pp. 103–105, 110–116). *Wajd* is a technical term in Sufism that literally means "ecstasy," but it also denotes "finding." In the words of the *muhaddis* and Arabic mystic, Abū Sa'īd ibn al-'Arabī (as cited by Ghazālī):

> Ecstasy (*wajd*) is the lifting of the veil, the contemplation of the All-Observant, the presence of understanding, the observation of that Unseen Realm, conversation with the Secret and association with that which is missing [. . .] And that is ecstasy (*wajd*) because he has found (*wajada*) what was lacking in him.
>
> (Macdonald, 1901–1902, p. 720)

The musician (*muṭrib*) sparks musical rapture (*ṭarab*), and the literal-minded opponents of *samā'* condemned this rapture as an illicit incitement to intoxication and fornication.[2] For the Sufis, however, this rapture was not (only) carnal but spiritual – leading to spiritual intoxication (*mastī*) and the annihilation of the ego (*fanā'*). Nevertheless, around the propriety of *samā'* raged what H. G. Farmer has described as "the most interesting of Arabic polemical literature," namely, the interminable debate as to whether *samā'* was a required religious practice (*wājib*), a permissible practice (*mubāḥ*) or altogether forbidden (*ḥarām*) (Farmer, 1942, p. 1; Robson, 1938, pp. 3–16; Shiloah, 1995, pp. 31–44). The party lines of this debate have been neatly drawn by Arthur Gribetz, who observed that the skirmish over the permissibility of *samā'* is representative of a larger conflict between the "Sufi support of the Neoplatonic 'eros' doctrine and the Hanbalite-orthodox support of the 'nomos' doctrine" (Gribetz, 1991, p. 82). Hence modern scholarship on *samā'* is generally content to sketch out three obvious perspectives on music's legitimacy: first, the staunch supporters, almost invariably Sufi apologists such as Abū Naṣr al-Sarrāj (d. 988), 'Alī b. 'Uthmān al-Hujwīrī (d. ca. 1072) and most famously, Abū Ḥāmid al-Ghazālī (d. 1111); second, the sober-minded, anti-musical bias of legalists and theologians such as Ibn Abī 'l-Dunyā (d. 894) and Ibn Jawzī (d. 1201); and third, the moderates, who saw both sides as offering kernels of truth (e.g., Lewisohn, 1997, pp. 1–4; Shiloah, 1995, pp. 31–44).

There is, I would add, a fourth group of writers on *samā'*, whose texts resist this easy classification. It is a category of writers who rise above the fray and refuse to wield the weapons of logic and proof with which the apologists deftly parried their opponents. To this category belong the poetic, symbolic and, above all, esoteric writers on *samā'*, such as Shihāb al-Dīn Suhrawardī (d. 1191), Rūzbahān Baqlī Shīrāzī (d. 1209), Farīd al-Dīn Aṭṭār (d. 1220), Ibn 'Arabi (d. 1240) and Jalāl al-Dīn Rūmī (d. 1273). It is crucial to stress that for such writers the legitimacy and practical reality (*qua* ritual) of *samā'* are unquestionable. But employed as symbol and image, *samā'* expands its connotative range by supporting itself on poetic imagery and esoteric commentary.

To begin to find the role of Pythagoras and the harmony of the spheres in this tradition, we must begin at the beginning: the genealogy of wisdom. The Arabio-Persian philosophical tradition generally laid claim to a late-Platonic orientalising genealogy of wisdom practitioners (Horky, 2009; Walbridge, 2001). In many sources on Zaradosht (Zoroaster or Zarathustra) and Pythagoras, including Biruni's *Chronology of Ancient Nations* (c. 1000), Zoroaster was a native of Azerbaijan, studied as a youth in Harran, and was connected to Pythagoras (and Pythagoras's disciples) during Pythagoras's "Babylonian captivity" (Pingree, 2002; Taqisadeh, 1937, 952–953). According to al-'Āmirī's Neoplatonic *Kitāb al-amad 'alā 'l-abad* (*On the Afterlife)* (ninth century CE), Pythagoras kept company with Solomon's companions and from them learned the geometrical, physical and divine sciences, which he transferred to the Greeks. "Furthermore, by his own

intelligence he discovered the science of melodies and submitted them to ratios and numbers. He claimed that he had acquired these sciences from the niche of prophecy (*mishkāt al-nubuwwa*)" (Rowson, 1988, pp. 70–71). While the first phrase focuses on Pythagoras's rationality and offers an intellectualised origin for a ratio-based music theory in line with Greek theory, the second phrase is (as Rowson points out) an obvious Islamification (the term *mishkāt*, "niche," derives from Qur'an 24:35). A statement similar to al-'Āmirī's on Pythagoras's discovery of the principles of music appears in the *Rasā'il* of the Ikhwān al-Ṣafā': "through the outstanding quality of [Pythagoras's] thought, [he was] able to derive the basic principle of music and the tones of melodies" (Ikhwān al-Ṣafā', 2010, p. 121). But this statement does not stand alone as the singular epitome of Pythagoras's supreme rationality; it is in fact closely conjoined to Pythagoras's ritualised purity, namely the "purity of the substance of his soul and the intelligence of his heart." It was through these that "Pythagoras the sage was able to hear the tones of the movements of the celestial spheres and the heavenly bodies (*naghamāt ḥarakāt al-falak wa al-kawākib*) and through the outstanding quality of his thought was able to derive the basic principles of music and the tones of melodies. He is the first of the sages to have spoken about this science and to have given instruction concerning this secret and after him came Nicomachus, Ptolemy, Euclid and other sages" (Ikhwān al-Ṣafā', 2010, p. 121).

As the *Epistle on Music* continues, the harmony of the spheres becomes more and more important:

> souls yearn to ascend [to the world above] in order to listen to these [harmonies] and to gaze upon these [movements], just as the soul of Hermes Trismegistus ascended and saw [. . .] and just as the soul of the sage Pythagoras heard, after it had been purified of its base physical desires and refined by spiritual thought and arithmetical, geometrical and musical mathematics.
>
> (Ikhwān al-Ṣafā', 2010, p. 148)

The harmony of the spheres, in the end, serves as the aspirational goal of all auditory activities. For, as the Ikhwān al-Ṣafā' argue, the very matter of the craft of music, very much unlike the other manual crafts (which deal with "naturally occurring material" and whose products are "physical forms"), "consists entirely of spiritual substances [*jawāhir*], namely, the souls of those who listen to it" (p. 77).

The primary instrument for the realisation of this "spiritual" music is the lute (*'ud*), whose construction by "musician-sages" was precisely attuned to cross-cosmic correspondences: "We may say that the musician sages restricted the number of lute strings to four, no more, no less, so that what they produce should correspond to natural phenomena in the sublunar world" (Ikhwān al-Ṣafā', 2010, p. 128). The correspondences are as follows: the highest string corresponds to fire in "heat and fierceness," and it strengthens yellow bile and attenuates phlegm; the second string corresponds to air in "wetness and softness," and it strengthens blood and softens black bile; the third string corresponds to water in "wetness and cold," and it strengthens phlegm and reduces the intensity of yellow bile; and the lowest strings corresponds to earth in "heaviness and thickness," and it strengthens black bile and calms the passion of blood. (For a full account of this passage on the construction of the lute see Neubauer, 1993.) When the cosmically resonant lute strings are tuned to the proportions 4:3, 3:2, 5:4 and 9:8, their humoural properties further correspond to the celestial proportions, for the "best-made artefact . . . and the most beautiful composition" are those which embody and reflect "the order of the distances of these spheres and stars, with their motions corresponding to one another" (Ikhwān al-Ṣafā', 2010, p. 147). This allows souls in the world of generation and corruption to recall the joys of the celestial world and thereby "to yearn to ascend there and join their fellow souls" (p. 118). To the contrary, when sounds without such harmonious inner relationships strike the ear of listeners,

> they disturb the temperaments and destroy their equilibrium sometimes even causing sudden death. [. . .] Well-balanced and well-measured sounds that stand in proportionate relationships help restore equilibrium to the blend of the humours. They please the natural disposition: spirits enjoy them and souls are delighted by them.
>
> (Ikhwān al-Ṣafā', 2010, p. 97)

In the Ikhwān al-Ṣafā's *Epistle*, however, the site for listening remains strictly located in the sublunary realm, even as the precisely co-ordinated set of cross-cosmic resonances, thoroughly understood in terms of mathematical proportions, lead listeners to aspire to higher realms. But in my final case study, proportionality is subordinated to a higher form of listening and the activity of listening itself changes its situation. Hearing is not delimited by the audible range of the material ear, for this external sense (*ḥiss-i ẓāhir*) must yield to an internal sense (*ḥiss-i bāṭin*), signified by auricular and intellectual metaphors of the *gūsh-i jān* and *gūsh-i dil*, the "ear of the soul" and "ear of the heart." These in turn are poetic evocations of a deeply Pythagorean, but specifically Persianate reinterpretation of Greek harmonic theory, one not grounded only in the rationality of mathematical ratios, deduced through controlled experimentation, but also modelled upon Pythagoras's ethereal auditory powers, bestowed through ritual purity (as already hinted at in the *Epistle on Music*).

Case Study Three: Hearing in "That World"

An episode in *Iskandar-nāmah (The Book of Alexander the Great)* of Niẓāmī Ganjavī (d. 1209) pointedly raises the questions of the philosophical orientation of *samā'* and of knowledge acquisition more generally (Bürgel, 1986, 1991, 2000; Niẓāmī Ganjavī, 1938, pp. 85–92). Niẓāmī's *Book of Alexander*, among the most famous and widely circulated Persian re-tellings, is divided into two parts. In the second section, *Iqbālnāmah ya khiradnāmah-yi Iskandari (The Book of Alexander's Fortune or Wisdom)*, Alexander – upon his triumphal return to Rum (Roman Byzantium) as king of the whole civilised world – surrounded himself, portrayed as both sage and prophet, with an eclectic and, admittedly, anachronistic group of philosophical advisers, including Hermes, Thales, Balinas (that is, Apollonius), Socrates, Plato, Aristotle and Porphyry.

Midway through this second section, Alexander called these and other philosophers to his throne so that each might expound his field of knowledge. One boasted his expertise in natural philosophy, another solved theological conundrums, still another solved problems in spherical geometry and so on, until Aristotle was granted the floor and claimed a mastery of all the sciences. All those who had previously boasted had learned their science from him, their superior in all fields of knowledge (Niẓāmī Ganjavī, 1938, pp. 85, l. 10–86, l. 12). Plato, however, was not so easily outdone, but he knew better than to challenge Aristotle in a logical argument. Instead, he excused himself and withdrew to his thinking barrel (a conflation with Diogenes, not out of place in an Alexander Romance) and listened intensely to the music (*āwāz*) of the seven spheres (86, l. 16–87, l. 1).

Instructed by their cosmic harmony (*ahang*), Plato weaves a veil/musical mode (*parde*) from instrument strings bound by the same proportions he heard in the spheres (Niẓāmī Ganjavī, 1938, 87, l. 5–88, l. 1). Niẓāmī casts Plato as a *ghinā sāz-i āwāz-i rūd*, a song-composing string player – or "singer-songwriter" to use a more familiar image – but also as an instrument builder, for in determining the ideal string proportions (*nisbat*) and discovering the veil (or mode, *parde*) that they can weave when properly perceived, Plato has in fact contrived the ideal instrument for their sonic realisation (87, l. 3). Niẓāmī calls it an *arghanūn*, an "instrument," "tool," or more specifically, an "organ," a subtle but doubtless intentional pun on the Aristotelian *arghanūn* or *organon*, as his logical works were known in both East and West (87, l. 9). Plato (already) has one-upped Aristotle and created his own "organ."

Playing upon his own "organ," then, Plato demonstrates to Aristotle and the other philosophers the power of this instrument and of the modes he has woven. One summons and animates all living creatures, another casts them into a deep, hypnotic sleep, from which only a third can revive them. Aristotle, not so easily outdone, tries to duplicate Plato's feat. Although he, too, finds the first few modes and demonstrates their summoning and soporific power over a few unlucky subjects, he remains deaf to the crucial vivifying mode and his sleepers do not waken. Aristotle must concede defeat and calls upon Plato, the superior philosopher, to re-awaken the sleepers.

J. Christoph Bürgel has several times suggested that this competition offers a general lesson in the primacy of Platonism over Aristotelianism (Bürgel, 1986, pp. 99–101; 1991, p. 114; 2000, p. 134). This is especially notable since *The Book of Alexander the Great* was composed only a few years after the death of Shihāb al-Dīn Suhrawardī, whose Illuminationist (*Ishrāqī*) philosophy likewise re-asserted the superiority of the Pythagorean and Platonic tradition over Avicennian Aristotelianism. Suhrawardī believed that perception was anchored not in the arcane machinery and mechanisms of geometrically calculable rays (in the case of vision) or mathematically measurable vibrations (in the case of audition) but was simply "the unveiled presence of the thing known before the conscious subject" (Walbridge, 2000, p. 157). In essence, this is his doctrine of "knowledge by presence" (*al-'ilm al-ḥuḍūrī*), which denies all mechanistic descriptions of sound (and other sensibles): vibration conveyed by the air cannot tell the whole story (see Suhrawardī's account of audition in Suhrawardī, 1999b, §105). Suhrawardī wields a razor to rival Ockham's and pares away physical causality, mechanistic descriptions and arithmetic ratios of vibrations to cut to the crux of audition. Sound in general and musical sound in particular, is irreducibly experiential. Like light, it is a "simple sensible" that is known innately and as such has no definition (or *qua* music, has no *ratio* or *logos*) that could capture or convey its experiential quality (§105).

Moreover, in light of the *inner senses*, which are synaesthetically interconnected insofar as they are all branches of the same root (*aṣl*), music is not just heard, it is seen. To cut oneself off from the body is to seal the outer senses and perceive the world of the Unseen (*'ālam-i ghayb*) with the inner senses. When the five external senses are closed, the internal senses are set in motion. The realm of this unitary perception is the *'ālam al-mithāl*, for which Henry Corbin, its most celebrated (if problematic) commentator, has coined the Latin phrase *mundus imaginalis* (imaginal world). It is "the world of incorporeal figures" (*'ālam al-ashbāḥ al-mujarrada*) and the world in which "spirits are embodied and bodies spiritualised" (this is the famous formulation of Kāshānī [d. 1680]; see Corbin, 1977, p. 134). There the purified seekers, Suhrawardī writes, "can and do bring images into being. They can call forth such tastes, forms, pleasant sounds and the like as they desire. These forms are more perfect than those that we have" (Suhrawardī, 1999b, §244). The prophets, saints and others, Suhrawardī claims, "may learn of the unseen when written lines descend upon their souls or they hear music (*samā'*)" (§256 [trans. modified].) In the *mundus imaginalis* we hear (and see and taste) the very image of sound itself (*mithāl al-ṣaut*), which is nothing other than the harmony of the spheres.

It will be instructive to remember that in the Latin West, celestial harmony was generally envisaged as the musical yet inaudible manifestation of mathematically demonstrable ratios, whether calculated between the weights, speeds or placement of the planets (Hicks, 2017, pp. 229–245). But not so for Suhrawardī. "The spheres," he writes, "have sounds not caused by the same causes as our sounds" (Suhrawardī, 1999b, §258). If sounds, even in the sensuous world of matter, cannot be adequately accounted for by vibrations or waves, how much more pure is the harmony of the immaterial spheres? Suhrawardī concludes, "Thus, there may be sound and music in the spheres not conditioned on air or ringing. There is no conceivable music more pleasurable than their music" (§258). Moreover, he compares the harmony of the spheres to the "awful sounds heard by the mystics." This sound, too, cannot be the vibration of air in the brain; "instead, it is an image of sound (*mithāl as-ṣaut*) – which is a sound" (§258).

Commenting on this passage, the thirteenth-century polymath Quṭb al-Dīn Shīrāzī links this celestial, non-vibrational music with the very origins of terrestrial music, offering a variation on the Pythagorean discovery of music, which integrates a passage from the Ikhwān al-Ṣafā' (discussed above) into Suhrawardī's metaphysics:

> Pythagoras related that his soul rose as far as the higher world. Due to the purity of his being and the divinatory power of his heart, he heard the melodies of the Spheres and the sonorities produced by the movements of the heavenly bodies: at the same time he became aware of the discreet resonance of the voices of their angels. Afterwards he returned to his material body. As a result of what he had heard he determined the musical relationships and perfected the science of music.
>
> (Corbin, 1977, p. 134)

Music theory and the musical relationships it studies, is here subordinated to Pythagoras's ability to hear the harmony of the spheres, comparable to the "image of sound" (*mithāl as-ṣaut*) heard by the mystics in the world of images, the *'ālam al-mithāl*.

In Suhrawardī's mystical epistle, "On the state of childhood," the implications of this otherworldly philosophy of audition for *samā'* are made clear. When a spiritual novice asks his Master, "During *samā'* the sufis get into a state (*hāl*). Where does it come from?" the Master replies:

> When a man seised with yearning hears a yearning melody, he sees the form of his own mood (*surat-i wāqiah*). Like India coming to the mind of an elephant, the soul becomes mindful of its own [original] state (*hāl*), takes the experience (*ẕauq*) from the hand of the ear and says, "You are not worthy to listen to this!" The soul deposes the ear from listening and listens for itself – but it listens in that [other] world (*ān 'ālam*), because in that [other] world it is not the ear's job to listen.
>
> (Suhrawardī, 1999a, pp. 54–55 [trans. modified])

By the phrase "*that* [other] world" (*ān 'ālam*), Suhrawardī means, as he often does in his mystical epistles, *'ālam al-mithāl*, that "world of images" from his *Philosophy of Illumination*. As he explains just before the passage quoted above, it is on this spiritual plane, beyond the "veil of secrets of secrets" (*parde-yi asrār-i asrār*), that *samā'* occurs (p. 54). The use of *parde* is, doubtless, purposeful in this context. Suhrawardī is playing on the double meaning (*īhām*) of *parde* as both "veil" and "[musical] mode": the mystic who has reached spiritual maturity hears not the sonic manifestation of the musical mode (*parde*) but rends the veil (*parde*) and listens to the autonomous form of sound itself. The ear of the soul, that is, the inner senses, takes the mystical perception of *samā',* expressed in this passage as the taste/experience (*ẕauq*) of *samā',* from the external ear.[3] Hence, the external musical form loses its importance, for what is to be perceived is beyond appearance or outward reality. In the final stage of ecstasy, the symbol of music is simultaneously the transcendence of music: the "music itself" becomes the entryway to the inaudible. The taste of *samā'* under Suhrawardī's pen becomes the essential symbol of the encounter with the other world, the symbol of the soul's experience (*ẕauq*) of divine reality in the imaginal world (*'ālam al-mithāl*).

It is suggestive that Niẓāmī's contest between the philosophers returns precisely to this Pythagorean position, with Plato as the standard bearer of the tradition, which is superior to the powerful but ultimately limited rationality of Aristotelianism. This Pythagorean/Platonic philosophy of audition in all its specificity suffuses the contest of the philosophers – and its outcome – in Niẓāmī's *Book of Alexander the Great*. Plato's retreat to Diogenes's barrel thus should not be read as a mere conflation of traditions; it symbolises the retreat from the material world to the spiritual world, where audition is most pure (and least material). The listening barrel, in fact, is what makes the harmony of the

spheres audible, for as Niẓāmī explains, "Plato's *samā'* would not have been beautiful were it not that the echo of the barrel makes all sounds beautiful" (Niẓāmī Ganjavī, 1938, 87.2).

Conclusions: Variations on a Pythagorean Theme

These case studies demonstrate the degree of variability in the philosophical tradition of Pythagorean speculation on music's role in the regulation of the human experience and the function of the harmony of the spheres within that causal nexus. As we have seen in Boethius and the twelfth-century cosmologists, the harmony of the spheres can function as an abstract harmony that the soul (somehow) experiences in its descent to the human body. The soul's own harmonic structure is implicated in and reflective of the broader cosmic harmony; hence, echoes of this harmony in sounding music can be "instrumental" in the re-harmonisation of the soul's own internal structure. Moreover, these celestial strains can be deliberately imitated and exploited by the mediation of an instrument, as in the Ikhwān al-Ṣafā's *'ud*, which was designed to capture and control, through a purposeful proportional attunement, the cross-cosmic resonances between the planets, the humours and the spiritual substance of the listener's soul. The instrumentalised realisation of this harmony leads its listeners to aspire to the higher harmonies, of which it is an echo. Finally, the harmony of the spheres can be explicitly theorised as the direct origin of music (and music theory) itself. The hearing of sounding music, then, prompts the "ear of the soul" to take over the listening experience, move beyond the sensuous pleasures of the bodily ear and listen for itself in "that world" – a world of images in which the harmony of the spheres and the sounds heard by the mystics become an "image of sound" (*mithāl as-ṣaut*) accessible only to the internal ear.

It would be rash, however, to essentialise these views as representing "the Latin," "the Arabic," or "the Persian" theory of harnessing music's power over the well-being of the soul (or body). To be clear, there are many examples from any one of these traditions that employ theories similar to the others. In the early fifteenth century, for instance, Jean Gerson developed a spiritual "music therapy" that heavily relied on a meditative listening practice that he called the "song of the heart" (*canticordum*), which has at least superficial (and doubtless coincidental) similarities to the Persian philosophy of audition outlined in my third case study (Fabre, 2005). Likewise, the role that the monochord played in the Latin West was, in many respects, similar to the role of the *'ud* in my second case study (which is not at all accidental as the *'ud* took the place of the monochord in Arabic discussions of Greek harmonic theory), and speculation on the relationship between the elements and instrument strings is found already in the Greek theory tradition (e.g., Aristides Quintilianus, *De musica* 3.10–23). Finally, the Arabic *Theology of Aristotle* (actually a translation of Plotinus's *Enneads* IV–VI by Ibn Nā'ima al-Ḥimiṣī in the mid-ninth-century) offered a thoroughly Platonic psychology similar to my first case study, replete with the descent of soul into the body and the idea of the soul as the mediator between the visible and invisible realms. This clearly influenced the Platonic sympathies of al-Kindī's *De radiis*, which is preserved only in Latin translation (d'Alvery & Hudry, 1974).

Nonetheless, I have focused on these three case studies because they cast into sharp relief the myriad ways that the harmony of the spheres can be used to regulate music's dangerous duality – its ability, as in the opening Aesopian tale, to blow hot and cold from a single breath. As an unnamed philosopher cautions near the end of the Ikhwān al-Ṣafā's *Epistle on Music* (in an account of a Greek "symposium" on music): "When you listen to music [*mūsīqī*], beware its arousal of animal desires in your soul for the beauty of nature, which might seduce you from the practice of right conduct and divert you from the higher Soul's intimations" (2010, p. 163). In Latin, Arabic and Persian sources alike, the harmony of the spheres offered a model of right conduct – whether in the heavens' contrary but harmonious motions, the properly proportioned strings of a lute or the *mithāl as-ṣaut* heard by the mystics in the *'ālam al-mithāl*.

Notes

1 Florence, Biblioteca Nazionale Centrale, Conventi Soppressi I.1.28, ff. 57v–58r; Zwettl, Stiftsbibliothek 313, ff. 145va–b. Cf. Macrobius (1963, 1.12.13–14). On this commentary and its connections to the thought of William of Conches, see Hicks (2012, pp. 322–324; 2016).

2 e.g., Ibn abī 'l-Dunyā (d. 894) in his *Dhamm al-malāhī* (*Censure of the Instruments of Diversion*) cites the censure of Yazīd ibn al-Walīd that music "decreases shame, increases desire and destroys manliness and verily it takes the place of wine and does what drunkenness does [. . .] for singing is the instigator of fornication" (Robson, 1938, p. 27).

3 *ẕauq* (Arabic, *dhawq*) literally denotes "taste" and is thus counted among the five outer senses (e.g., Suhrawardī, 1999b, §215), but it is also a technical term in Sufism describing the experience of mystical knowledge (sometimes translated as "intuition").

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GIROLAMO CARDANO ON MUSIC AS A REMEDY "FOR THE TROUBLES THAT RESULT FROM THE MISERY OF HUMAN MISFORTUNE"

Jacomien Prins

Introduction

In addition to being an important astrologer, mathematician, philosopher and physician, Girolamo Cardano (1501–1576) occupies an important place in the history of theories about the relationship between music, the soul and happiness. His contributions to these theories range from a detailed analysis of the role of musical consonances and their mathematical proportions and a defence of the priority of the sense of hearing to theories about human music (*musica humana*). Just like his ancient and medieval predecessors, Cardano believed in the existence of an inaudible cosmic harmony (*musica mundana*), of which the harmonies of a correspondingly well-ordered human life (*musica humana*) are an integral part. Moreover, he was convinced that by using vocal and instrumental music (*musica instrumentalis*) humans are capable of mediating between the perfect harmonies of the heavenly spheres and the potential chaos and disorder of the lower worlds (Haar, 1973; Prins, 2017c; for these conceptions see also Pelosi and Hicks in this *Companion*).

Cardano's ideas about health as a harmony and the edifying and healing power of music can be found in his *On Music* (*De musica*, 1574), his most extensive and important text on music theory of which a summary is included in his *On Subtlety* (*De subtilitate*, 1550).[1] Moreover, they are scattered among other texts such as his *On Gaining Advantage from Misfortunes* (*De utilitate ex adversis capienda*, 1561) and *On Tranquillity* (*Theonoston seu de tranquilitate*, 1561), in which Cardano tries to formulate an answer to the questions of what one can gain during life on earth that is enduring and meaningful and how one can cultivate a tranquil soul (Fierz, 1983, pp. 156–166; Siraisi, 1997). When he focuses on grief, illness and death, that is to say, the "misery of human misfortune" that he considers to be the main impediments for a carefree, virtuous, happy and long life, he tries to formulate a psychologically realistic response to these problems, in which music plays an important role (*On tranquillity* transl. in Miller, 1973, p. 204; Cardano, *Opera Omnia* [hereafter abbreviated as '*OO*'] vol. 2, p. 345). In this chapter, I am going to argue that in response to traditional ideas about music's power to influence the hearer's "passions of the soul" (emotions), morals, behaviour and health, Cardano puts an eclectic and sometimes innovative secular music psychology into words, in which the concept of health as a harmony plays a fundamental role.

Looking at his writings, it is hard to make a clear distinction between Cardano's use of the words "passion of the soul" (*passio*), "affection" or "mood" (*affectus*) and "state of mind" (*imago*), which are all close to, but not identical with, our modern concept of "emotion." (On the early history of these concepts, see Dixon, 2003, pp. 1–61). In addition to exploring his ideas about human nature, I will show that both the musical cultivation of a tranquil soul and the experience of musical pleasure are the focal points of his theory of music therapy. Moreover, I will demonstrate how Cardano presents making and listening to music as an alternative to the physical and psychological care offered by the physicians, philosophers and theologians of his day. First, I will address his theory of health as a harmony, followed by a discussion of his ideas about music's influence on physiological and mental functioning, music's role in the pursuit of happiness or well-being and music therapy as a form of self-care.

Health as a Harmony

The ten copious volumes of Cardano's *Opera omnia* deal with Renaissance scholarship in all its aspects (Cardano, 1663). The art of living long and virtuously in physical and mental health is addressed in books such as *On Consolation* (*De consolatione*, 1542), *On Wisdom* (*De sapientia*, 1544) and *On Gaining Advantage from Misfortunes* (1561).[2] In the context of his theological writing, Cardano defines this art in terms of the care for one's immortal soul (Rice, 1958, p. 166). Humans cannot achieve this kind of care by themselves, it is a kind of grace that will be given by God to the pious. Yet in *On Wisdom* he is aware that a pious lifestyle would not necessarily lead to a secure and happy life on earth, but will at best guarantee such a life in the hereafter (*OO* 1, p. 501.) Fully in line with the spirit of the Renaissance, he is not satisfied with this kind of happiness, but aims to discover how it can be obtained already during life on earth.

In order to find out what will make for a healthy and harmonious earthly life, in *On Gaining Advantage from Misfortunes* Cardano deals with strategies to handle adversity and what he considers to be the greatest problem in life, namely, the fear of one's own illness and death and grief over the illness and death of loved ones (McClure, 1991, p. 161). This book is partly the result of Cardano's own experience, because he himself experienced great adversity during his life. As narrated in his autobiography and in several other places of his oeuvre, one of his two sons murdered his wife and was beheaded for his crime.[3] Cardano was haunted by this traumatic experience and addressed it in various books in order to answer questions such as whether he as a father could have prevented it from happening (Fierz, 1983, pp. 125–155).

Based on his own life experience Cardano looked for a psychologically realistic response to these kinds of human problems, a response that is in line with an emerging secularisation and its new naturalist view of human nature (McClure, 1991, p. 162; Park & Kessler, 1988). In *On Gaining Advantage from Misfortunes* Cardano argues against the practices of theologians and philosophers:

> Many would object that the Theologians would better be able to teach and persuade in these matters. But that is completely false. For they, like the Philosophers, are engaged only in those things that seem paradoxical: for instance, where they teach that poverty ought to be embraced, we teach that it ought to be fled. They praise sickness, disgrace and calamities, we, on the other hand, recommend that those things be avoided if possible or, if not, *we teach how they can be endured more easily or how by harmonising evils with goods, they may be made lesser and tolerable* [my emphasis]. Thus, whereas our whole enterprise is built around facts and actions, the Theologians only dispute changing or handling things minimally. Whence it happens that their argument differ more amongst themselves than night from day.
>
> (transl. McClure, 1991, p. 163 [trans. modified]; *OO* 2, p. 16)

In order to obtain knowledge of how hardship can be endured and happiness obtained, Cardano consults the philosophical views of a harmonious and healthy life of his predecessors. In line with

Plato and Aristotle, he defines the art of living a good and satisfying life above all in terms of living in accordance with a naturally acquired knowledge and with certain principal virtues (Rice, 1958, p. 167). He conceives of the knowledge of living well not only as something speculative, but also as a set of moral rules to put into practice. This kind of knowledge includes metaphysics and ethics, but also knowledge associated with the seven liberal arts, among which stands the art of music.

The concept of music as a liberal art has its origins in ancient Greek music theory (see Pelosi in this *Companion*). In this context theories of ethos were developed, in which musical concepts were used to both represent and influence the morals and health of a human being.[4] Some ancient Greek music theorists conceived of the human soul as a harmony, which in analogy with a musical string could be tempered by musical ethos so that it would have the right tension. During the Renaissance the concept of the soul as a harmony experienced a true revival in Italy and various aspects of the Pythagorean and Platonic theories with which it was associated were high on the agendas of many scholars, including that of Marsilio Ficino (1433–1499), who wrote influentially on music theory (Prins, 2014, pp. 186–206; Walker, 2000, pp. 1–24). Cardano inherited from these scholars an interpretation of *musica humana* in which the relation of soul to body is envisaged as an organisation by a pre-existing harmony of numbers that outlasts the body. Moreover, he tried to combine this view with an ancient concept of soul as a harmony of the body, like the tuning or temperament of the string of a lyre. For example, the concept of soul as a "tuning" (*intentio* or *harmonia*) of the body is discussed at length in Plato's *Phaedo* (85e–86d, 91c–95a) (Plato, 1955; Hicks, 2017, pp. 113–150). To understand how, let us first have a look at the principles of his music theory and his view of the power of music.

Cardano's *On Music* begins with an explanation of music in terms of numbers and their proportions, thus grounding his thought in the Pythagorean-Platonic tradition, in which the soul is conceived of as a harmony of abstract numbers, which both logically and metaphysically precedes physical phenomena such as sounding bodies (Moyer, 1992, p. 160. See also Pelosi in this *Companion*). Pythagoras and Plato and their followers believed that the numerical ratios of the consonant intervals of the octave (2:1), the fifth (3:2) and the fourth (4:3) corresponded not only to pitch or tuning but to the harmonic structure of the whole world and all its parts and powers. One of these animated parts is man; both the organisation of his soul and body as well as the relationship between his body and soul are seen as an embodiment of cosmic harmony. In book xi of *On Subtlety* "On the necessity and form of man," for example, Cardano defines the perfect proportions of all parts of a human being in terms of harmonic ratios (*OO* 3.2, p. 555). However, Cardano is not satisfied with this Pythagorean-Platonic view of *musica humana*, because it is merely a static description of human nature. In his view, a definition of human nature in terms of harmonic proportions should involve an explanation of the dynamic interaction between the human body and mind, which underpins man's mental and physiological functioning. To supplement existing theories of *musica humana*, Cardano formulates a view of health as a harmony in terms of physiological processes including the dynamics of the passions of the soul (Palisca, 2006, pp. 179–202). For this purpose, he consults Hippocrates and Galen (Siraisi, 1997, pp. 119–145).

The Greek physician Galen (129–ca. 200 C.E.) argued that there is a direct causal connection between bodily constitution and character. Inspired by this idea, Cardano made the doctrine of the passion of the soul the centre of his theory of *musica humana*, because it enabled him to explain the direct influence of music on body and soul. The ethical and philosophical training discussed above, combined with the health exercises given in *The Art of Preserving Health* (*De sanitate tuenda*, 1560), constitute a united theory of health in which the search for wisdom, moderation and harmony is a central issue (*OO* 6.2, pp. 8–294). Following Galen's example, in his own *The Art of Preserving Health*, Cardano defines health as a condition that is in line with God's law and natural law; that is, as a form of human harmony that is an expression of cosmic harmony (Green, 1951; *OO* 6.2, p. 21).

Music's Influence on Physiological and Mental Processes

Cardano's view of spirits, humours and temperaments, as presented in book xii of *On Subtlety*, "On man's nature and temperament," is also inspired by Galen and Galenism (*OO* 3.2, pp. 556–569; Siraisi, 1990, pp. 78–114). By extending ideas about the harmonious structure of the elements in Plato's *Timaeus* 53c–55c (Plato, 1937), physicians such as Galen argued that by analogy to the four elements of the cosmos, there are four humours in a human body – blood, phlegm, yellow bile and black bile – which possess the same elementary qualities; that is, heat, dryness, moistness and cold. The four elements, humours and their qualities were linked to four different temperaments of people – sanguine, phlegmatic, choleric and melancholic (caused by varying mixtures of the four humours that make up the body). Health was defined in terms of a balanced presence of the four humours in man. Furthermore, from book xiii "On the senses, what can be sensed and pleasure" it may be inferred that Cardano also adhered to the traditional idea that there are four types of voices, tones or kinds of music that complete the system of harmonic correspondences underlying his views on the power of music (*OO* 3.2, pp. 570–581). For a summary of Cardano's harmonic world view, see Table 4.1 below.

Following the medical tradition, Cardano believed that each of the three fundamental members of the body – the brain, heart and liver – is governed by a mortal part of the soul, that is, a spirit (*pneuma*).[5] *Pneuma* was translated into the Latin word *spiritus* (spirit), which can be associated with modern concepts such as *élan vital* and energy. In Galen's physiological system, the liver is dominated by the natural spirit, which is a vapour rising from the blood that controls the functions of nutrition, growth and reproduction. The heart is dominated by the vital spirit, which is the natural spirit transmitted in the veins and transformed in the heart by mixture with air that is breathed in. It regulates the vital functions, conveying heat and life through the arteries. This vital spirit is submitted to a second transformation in the brain where it becomes animal spirit, which regulates the brain, nerves and feelings. In sum, Cardano regards the vascular and spiritual structures as interlinked pathways of transmission, which is accomplished by means of spirit. Resilience is the perfect amount of spirit in the body than can be compared to the perfect tension in the string of a lyre. Thus, spirits perform many functions in Cardano's physiology that are nowadays attributed to the nerves.

According to Cardano, the amount of spirit in the blood will subside if someone is involved in the act of thinking or imagining for a long time, for example in the case of scholars "who disperse their spirits on account of their study" (*OO* 3.2, p. 558).[6] Ficino became very famous for his theory of the music-spirit relationship theory, which was based on the idea that an overdose of black bile resulting in melancholy could be remedied by listening to music. He argued that the sense of hearing was of the same substance – that is spirit – as what is sensed and that musical sounds animated with spirit could enter the human spirit through the ears and replenish the amount of spirit inside the human body (Walker, 2000, pp. 3–9).

In contrast to Ficino, Cardano was mainly interested in the physiological aspects of melancholy and not in the potential of melancholics to connect to supernatural worlds, for example through

Table 4.1 A fourfold system of harmonic correspondences between the world, man and music

Musica mundana		*Musica humana*			*Musica instrumentalis*
Element	*Primary qualities*	*Humour*	*Organ*	*Temperament*	*Voice/Tone/Kind of music*
fire	dry and hot	yellow bile	heart	choleric	high/quick tone (soprano)
air	hot and moist	blood	liver	sanguine	medium high/quick tone (alto)
water	moist and cold	phlegm	brain	phlegmatic	medium low/slow tone (tenor)
earth	cold and dry	black bile	spleen	melancholic	low tone (bass)

music. Consequently, he conceived of music as inanimate vibrating air and focused on the question of how music is capable of influencing human physiology, especially the passions of the soul. In *On Proportions* (*De proportionibus*, 1570), Cardano explains how music is transmitted through the human body and mind by means of spirit:

> It remains to be seen by what means sound influences the passions of the soul. It is not due, however, to the soul, which is immortal and immaterial, but rather either to that part of the body which is the instrument of the soul (that is, the spirit) or to the principal conjunction by which the soul is joined to the body.
>
> (transl. Moyer, 1992, p. 164 [transl. modified]; *OO* 4, pp. 173–174)

Animal spirits also play an important part in Cardano's theory of the sense of hearing (Prins, 2017b). He argues that the ear contains animal spirits, which are in direct contact with the vibrating air of which sound consists. Because sounds can influence the animal spirit and thereby the mind directly, the sense of hearing is superior to all the other senses. Moreover, Cardano distinguishes between hearing and listening in quite an innovative way. Intentionality (that is, a quality of a mental state which consists in its being directed toward an object) becomes important for what a listener is capable of hearing and understanding. In book xiv of *On Subtlety*, Cardano puts this insight into the following words:

> How much bodies are influenced by conditions of the soul is shown by those who neither see nor hear while concentrating attentively: their eyes or ears are open, but they cannot see nor hear. But they can concentrate and consequently feel less, so that at times when concentrating they do not even feel pain.
>
> (trans. Forrester, 2013, vol. 2, p. 750 [transl. modified]; OO 3.2, p. 585)

In contrast with many of his predecessors, Cardano does not believe that the power of music can be explained in terms of general objective properties of the sense of hearing and musical sound, but acknowledges that music can only have a healing of moral effect if the listener is in the "right" subjective mental state for these effects. Cardano concludes his discussion of the connection between sounds, the sense of hearing and the passions of the soul as follows:

> So passions of the soul alter bodies, but sounds alter the [mortal parts of] souls. Hence sounds must alter bodies. The strongest of all passions are fear and courage and sounds can stimulate these – trumpets demonstrate this, the Spartan invention of drums, the horns of the barbarians and the shouting of the Romans – at the start of a battle, the Romans used to make such a huge din that Josephus was forced to block the ears of his Jewish soldiers, to stop them being terrified or getting stunned.
>
> (trans. Forrester, 2013, vol. 2, p. 750 [transl. modified]; *OO* 3.2, p. 585)

It is precisely the lost knowledge of these amazing musical effects of ancient Greek, Roman and Jewish civilisations that Cardano seeks to revivify in his time, as we will discuss in further detail below.

Music's Role in the Pursuit of Happiness or Well-being

In *On Gaining Advantage from Misfortunes* Cardano formulates a view of the value of music from the perspective that a long and virtuous life is necessary for happiness. Making and listening to music

are discussed as part of the art of living well for a long time. As argued above, given that music has such a deep connection with the passions of the soul, in ancient music theory and philosophy it was seen as the ideal tool to temper the human mind.

In his investigation of how this process of tempering manifests itself in the human mind, Cardano takes the relationship between spirit and the passions of the mind as his point of departure in *On Proportions*:

> So indeed it [the spirit] deserts the body; or if impeded in its relation with the body, the body dies away. The mind presages this; fear and sadness comprise the anticipation of death. So on the other hand, happiness is none other than communion between body and soul; and to the extent they are joined, it calls to mind only life. And therefore, as if immortal, he who is happy is oblivious to death.
>
> (Cardano, *OO* 4, pp. 173–174, transl. Moyer, 1992, p. 164)

Music is associated with 'happiness', but this tentative answer to the questions of how music affects the passions of the soul and which passions it can and cannot induce, as argued by Moyer, is not entirely convincing, because it remains unclear precisely how the mechanism of music's effect on these passions must be understood (Moyer, 1992, p. 165). Cardano's ideas about this mechanism, in my opinion, will become clearer if we interpret them through the lens of his reception of Galen's physiological theory. In book xiv of *On Subtlety* "On the soul and the intellect," Cardano discusses the relationship between the senses and the spirits as well as the difference between life-enhancing and life-threatening passions:

> All the senses are delighted and grieved by something else. In response to delight itself, the spirits are carried outward and retire within through grief, quickly in powerful passions of the soul, but slowly and gradually in small ones. It is evident that also the spirit is conveyed along with the blood. When it [the blood] is carried outward, it is diluted, cooled and strengthened, if its powers [i.e. its spirits] are vigorous. When [the blood] becomes thicker, it is trampled and consumed. *If the heat [in the body] is reinforced*, digestion will take place, sleep will be won, the excretions are digested and *diseases are cured* – as we will also explain below. *But if the heat is reduced*, sleep is prevented, digestion is impaired, the excretions are retained and *diseases are created* [emphasis mine].
>
> (Forrester, 2013, vol. 2, p. 748, [transl. modified.]; *OO* 3.2, p 585)

Following Galen, Cardano explains in this passage that the passions of the soul have a direct connection with the amount of spirit and heat in the blood. Disturbances in this process of blood circulation were diagnosed by feeling someone's pulse:

> These arteries pulsate rhythmically with the heartbeat and this motion sustains the natural body heat. It also expels all impurities that have accumulated. This heat is increased by vigorous movements, as evidenced by a faster pulse rate, shortness of breath and perspiration.
>
> (*On Subtlety* bk. xii, transl. Fierz, 1983, p. 100; *OO* 3.2, p. 557)

The "music of the pulse" is not only connected with health and disease, but also with mental states such as fear and tension and happiness and relaxation (Prins, 2012). Cardano links these states with the nature of musical elements such as rhythm, tones, intervals and figures. The passions of the soul and someone's health can be influenced through music in either a beneficial or detrimental way. Quick and high music will accelerate the rhythm of the pulse and slow and low music will have the opposite effect (see Table 4.1 on p. 50).

Not satisfied with merely handing down the traditional theory of music's healing and moral effect, Cardano also tried to put it into practice in his own life. Yet, in the attempt to revive the lost power of ancient music to employ it in the education of his own children, something goes dramatically wrong. In order to understand "how music has subverted his own home and how he himself corrupted the morals of his own children" by exposing them to music, Cardano critically discusses music's edifying potential in *On Gaining Advantage* (transl. Miller, 1973, p. 198; *OO* 2, p. 116).

As the point of departure for his research he takes Plato's famous doctrine that music has the power to shape and condition the human soul in general and especially the malleable soul of a child. In the *Republic* 401D, for example, Plato theorised about the unique place of music in the education of young children, arguing that even before a child is old enough to reason "rhythm and harmony sink deep into the recesses of the soul and take the strongest hold there, bringing that grace of body and mind which is only to be found in one who is brought up in the right way. (. . .) Approving all that is lovely, he will welcome it home with joy into his soul and, nourished thereby, grow into a man of a noble spirit (Plato, 1945, p. 90).

The relationship between music and the young soul given by Plato in this quotation is fairly straightforward. First of all, he assumes that beauty, goodness, truth, harmony and health are linked. If a person experiences musical beauty when he is young, he will become a good human being who is also capable of perceiving the truth. In analogy with a musical string, the "recesses of the soul" can be tempered by musical ethos so that it will obtain the right tension. If they are tuned and tempered at a young age, they will vibrate at a constant and moderate speed and thereby guide higher cognitive functions such as the aesthetic and moral reason later on in life. But whereas Plato wrote about this subject from the point of view of an armchair philosopher, so to speak, Cardano as an experimental psychologist *avant la lettre* tried to revive the recommended Platonic practice of tuning the recesses of the souls of his own children, which led to serious problems. In the beginning of the report of his experiment, which is presented in *On Gaining Advantage from Misfortunes*, Cardano mixes Plato's doctrine of musical ethos with Aristotle's view of listening to and making music as a pleasurable activity:

> [Music] appears to be valuable, for both Plato and Aristotle maintain that boys should be instructed in it. (. . .) Music is also of worth because it is a pleasing pastime and is useful for discipline and as a cultural value of life. Also, since it affords pleasure without detriment it is beneficial to all and especially to children.
>
> (transl. Miller, 1973, pp. 197–198 [transl. modified]; *OO* 2, p. 116)

Yet, when Cardano tried to instruct his own boys in music, this proved to be incredibly difficult. In his time, the ancient Greek music for one voice (monody) had made way for many-voiced music (polyphony) as a result of which he has to let singers into his home who, to his mind, were all too often of easy virtue:

> Yet if one considers our modern complicated way of singing, which consists of many persons singing together and which cannot take place at one's own leisure, since there is a need for fellow singers and since so many of them have corrupt morals, we conclude that this practice is really of no use to anyone. You find hardly any musician in our time who does not abound in every kind of vice and thus such a musician is the greatest impediment (. . .) to all men in general. (. . .) If we do it [i.e. making music] at home the singers will (. . .) corrupt the characters of our young boys and adolescents, for most of them are drunkards and gluttons, also wanton, fickle, impatient, coarse, indolent and tainted with every kind of unlawful desire. The best of them are fools.
>
> (transl. Miller, 1973, p. 98 [transl. modified]; *OO* 2, p. 116)

Even though Cardano does not directly connect this analysis with the great tragedy of the death of his son, if we reconstruct what might have happened during these musical lessons, we may tentatively conclude that Cardano's project of reviving the lost power of ancient Greek music failed completely.

However, in this passage in *On Gaining Advantage*, personal observation and empirical reality did not triumph over bookish traditional knowledge. Even though the singers of his time had a very destructive influence on the tuning of souls, Cardano is not of the opinion that music should be expelled from the home and education of children. Against his better judgment, he continues to defend the ancient doctrine of the moral power of music by arguing that if one were to use instrumental music instead of polyphonic singing, the result would be a lot more beneficial. He argues, moreover, that because string instruments, recorders or pipe organs only need one person to play them, one can practise them alone and in so doing avoid the detrimental influence of many singers of his time:

> In this kind of [instrumental] music one can meet the three conditions that Aristotle proposed, namely, the confirmation of change of morals, passions or behaviour. These conditions also apply to the present times, both in the morals of children and adolescents and in the organisation of life.
>
> (transl. Miller, 1973, p. 117; *OO* 2, p. 116)

Fully in line with these ideas in *On Gaining Advantage*, in *On Tranquillity*, a treatise on activities that are favourable to the cultivation of a tranquil soul, Cardano praises the beneficial effect of solo music. In a discussion between a philosopher, a citizen and a hermit that is included in the book, he addresses the power of the Orphic lyre to tranquillise the human mind (*OO* 2, pp. 299–371). Against the backdrop of his general philosophical quest for longevity and happiness, this discussion can be best understood as an expression of the general rule of the pursuit of moderation in all things (Rice, 1958, p. 173). In this regard, making and listening to music can be used to learn how to be moderate in the passions and how to avoid harmful passions such as fear. Exposure to good music played by virtuous musicians will not only induce temperance, but will also help fortify the human soul so that it is capable of combatting certain vices. In short, music is a powerful tool to moderate human passions and to avoid vice. In addition, it can also bring a moderate amount of pleasure to one's life that is associated with the tranquility of mind. In this regard, music is given an essential role in Cardano's philosophy of life.

In his attempt to account for music's power to influence the passions of the soul in *On Music*, cap. xiii, "Modes," Cardano addresses the ancient and medieval view that specific musical modes, if used, would have specific emotional effects (transl. Miller, 1973, pp. 97–101). He reports that "Concerning the nature of the modes, Plato considered the Lydian useless . . . The Mixolydian was suitable for tragedies because it affected the emotions. . . . The Mixolydian is joined to the Dorian in tragedies, for the latter is filled with majesty and tragedy has both majesty and emotional meaning." Moreover, Aristotle states "that the Mixolydian was effective in causing weeping and commiseration and that the Phrygian caused fury and was inimical to peace of mind." So he approved of the Dorian above all, for it withdrew from passionate emotions and led to moderation (pp. 100–101). Yet in contrast with ancient and medieval theories in which certain musical modes were linked with specific passions of the soul and mental states such as love, hate and sleep, Cardano's treatment of the subject bears witness of his awareness that music cannot carry specific meaning in the same way as language (pp. 163–168; Schütze, 2001, pp. 453–467). Moreover, in *On Subtlety* he acknowledges that a passion or a state of mind is not induced simply by hearing a specific pattern of musical consonances and dissonances, but by the context in which these combinations of tones appear:

> better things are always pleasing after worse ones, but the opposite is displeasing. So light pleases after darkness, sweetness after bitterness, oil of roses after dill and consonances after dissonances.
>
> (transl. Miller, 1973, p. 212; *OO* 3.2, p. 572)

Hence, "happiness" can be induced by music, but it is not associated exclusively with a certain musical mode, instead it will most likely appear when a musician modulates in a certain passage from a musical passage with dissonances associated with fear and tension to one with consonances associated with relaxation.

In chapter xviii of *On Music* Cardano discusses the advantages and disadvantages one can gain from making or listening to music in further detail. Music can be used as a tool for the care of the self in three ways. First, music "pertains to instruction and study," second, it can be used for "the cleansing of the spirit" or, third, "to spending time pleasurably in leisure, tranquility and freedom from the pressure of more serious matters" (transl. Miller, 1973, p. 105). Ultimately, the three converge in one theory of the musical cultivation of a tranquil soul, in which mental problems can be cured by tempering certain passions of the soul:

> Teachers and disciplinarians have agreed on the expiative and purgative force of strong passions. When these passions subside they may become excessively reversed and softened by giving way especially to passions of misery and pity, causing dejection and depression. Music also was meant to fill such passions with a certain innocuous pleasure.
>
> (transl. Miller, 1973, pp. 100–101[transl. modified] 212; *OO* 3.2, p. 572)

Understanding how the ancient Greeks could cleanse the spirit musically becomes one of the ruling passions of Cardano's life. In *On Tranquillity* he addresses the theme again in order to find a cure for an unquiet human mind. The diagnosis of this disease is formulated by the philosopher in the dialogue:

> Since this tract is long enough, it is sufficient in the remaining part to show how men daily are distracted and even tormented with vain desires. We seek pleasure that is either good or bad, useful or useless, attainable or unattainable and in this way we spend our entire life, just as did Tantalus.
>
> (transl. Miller, 1973, p. 200; *OO* 2, p. 343)

This reference to the punishment of Tantalus, who longed for water he could not drink and food he could not eat, is a simile for people who during their lives on earth cannot reach the spiritual food that they need in order to reach happiness in life. However, if one would like to begin a more virtuous and fulfilling life with learning how to play a musical solo instrument, Cardano – in the dialogue *On Tranquility* by way of the persona of the philosopher – warns that this might turn out to be a less effective remedy that originally thought. Mastering an instrument involves a lot of practice, discipline and concentration and often turns out to be a frustrating activity, which is "hostile to tranquility," because "the source of this impediment is found nowhere else then in ourselves" (transl. Miller, 1973, p. 200; *OO* 2, p. 343). Having discussed the great inconvenience of the contemporary lyre with strings which "when they are tuned break from humidity and rain of from dryness and wind," the philosopher in this passage nevertheless comes to the conclusion that it is the most perfect instrument. Moreover, he argues that it is equal to the ancient *lyra* and therefore should be used to revive ancient Greek secret musical powers such as *catharsis*:

> The lyre possesses a mellifluous suavity found in no other instrument. From this it is thought that Orpheus moved rocks and trees with the *lyra*, not to mention that with it he also compelled brute animals to dance. In this way he also saved Eurydice from the underworld gods and brought her back to the upper regions of earth.
>
> (transl. Miller, 1973, p. 202 [transl. modified]; *OO* 2, p. 345)

Subsequently, Cardano – through his representative the philosopher – makes it clear that he attributes the most extensive emotional power in music to vocal music or song and that it is the text that is responsible for an additional power: "the lyre blends well with every other instrument, but above all with the human voice, so that one who plays it beautifully seems to be a god among mortals" (transl. Miller, 1973, pp. 202–203 [transl. modified]; *OO* 2, p. 345).

As explained above, the musical cultivation of a tranquil soul can be best achieved by the imitation of strong passions in music, which will induce catharsis (*On Music*, transl. Miller, 1973, pp. 142–144). Cardano gives an example of how a "negative" emotion can be induced by a particular kind of musical figure: "a commiserate state of mind by slow and serious notes by dropping downward suddenly from a high range imitates the manner of those who weep" (ibid., p. 143 [transl. modified]). If musical figures, such as slow and serious descending notes, imitate certain physical manifestations, such as weeping, this can lead to a beneficial release of the emotion (p. 167). If someone were to listen to a kind of mournful monodic song performed by a singer and a lyre player together, it could induce a form of musical catharsis resulting in a more carefree mood (Aristotle, *Politics*, 1339a11–1342b34, transl. in Andrew D. Barker (1984–1989), *Greek Musical Writings*, vol. I, pp. 172–182):

> Therefore, if there is an instrument appropriate to tranquillity and also a relation of metre and poetry to it, the instrument will be a cithara and the song will be mournful and almost tragic. In this way we can *lighten the cares that result from the misery of human misfortune* [emphasis mine].
>
> (*On Tranquillity*, transl. Miller, 1973, p. 204; *OO* 2, p. 345)[7]

Music is presented here as a leisure activity providing temporary freedom from care.

Music Therapy as a Form of Self-Care

On Tranquillity also includes a small musical composition with a text by Cardano, which is meant as an antidote to sorrow. The musical setting, presumably composed by his friend Giudeo, is an example of how knowledge of powerful ancient Greek monodic music was reinvented in Italy in the second half of the sixteenth century. Morley refers to Giudeo as "a composer who was then ninety-seven years old." Presumably, this refers to the famous Jewish lutenist Gian Maria Giudeo, who worked at the Medici court (Morley, 1854, vol. 2, pp. 239–240).

In this *Lament* (or *Dirge*) on the death of his son (Music example 4.1), Cardano expresses the general states of minds he admits to musical influence: happiness, sadness combined with pity, excitement and relaxation associated with acceptance and tranquility of mind. Even though Cardano's theory of music's healing and moral effects is based ultimately on Pythagorean and Platonic ideas of proportion, he does not simply derive the latter from the former. A passion of the soul or a state of mind is not induced by the presence of certain consonances or dissonances but by formulae in a certain mode that display a melodic progression characterised by a specific sequence of consonances and dissonances.

In this composition Cardano – presumably with the help of Giudeo – applies a theory of imitation, according to which art should imitate both classical Greek and Roman poetry and music as well as

the objects and events of ordinary life in order to be pleasurable and effective. (*On Music*, cap. xxxvi, transl. Miller, 1973, pp. 142–143.) Music should be modelled after ancient Greek musical modes to be able to express the four basic passions of the soul: sorrow, joy, excitement and tranquility. According to the theory of musical imitation, commiseration can be expressed by imitating "the manner of those who weep, for at first they wail in a very high and clear voice and then they end by dropping into a very low and rather muffled groan" (p. 143). Hence, Cardano has chosen the Lydian mode, because it is appropriate to express consolation in distress. Accordingly, the text and melody of the *Lament* can be interpreted as an early example of how a musical experience – be it actively as a composer or passively as a listener can – can be used for the purpose of self-care.

The sadness and pity of words such as *"O dolor ingens"* ("to your great sorrow"; line 18) is musically expressed by slow and serious dropping notes. (*On Tranquillity*, transl. Miller, 1973, p. 205 *OO* 2, p. 346) Moreover, in the line "Nunc tres concordes anima moriemur in una" ("Three souls at once under one stroke expire," line 7) the expiration is musically expressed by a repetition of one note on the same low pitch. The all-time low of wordless grief is expressed by the musical figure of a plaint (*Seufzer*) on the word "Heu" ("O", line 6). Subsequently, the expression of sorrow and grief in the first half of the composition leads to catharsis. The purgations and purification of sad passions of the soul associated leads to a change in the expressed state of mind toward hope for renewal and restoration. (On musical catharsis, see also Gouk and Eerola in this *Companion*.) First of all, there is the happiness and consolation given by Cardano's father: "heu, pater, en quis te solabitur" ("my noble father, solace who shall give," line 17) expressed by an uplifting musical figure. But the real tranquillity of mind is associated with Cardano's heavenly Father and a blessed life in the hereafter: words such as "Condidit auditis coelo his Deus astra sereno" ("God covered up the stars when this was said," line 27), a sentence in which the words "coelo" and "Deus" are given the highest pitches of the whole composition.

Musically, then, the composition can be read as an aural picture of the consoling hope that the soul of Cardano's son will have a blessed live in the hereafter. This hope was quite in contrast to the backdrop of the Christian belief that sinners such as Cardano's son, who murdered his wife, were punished in the hereafter. Hence, we may only hope that Cardano's *Lament* had a self-consolatory quality and that his enormous grief about the death of his son was lightened by his self-induced music therapy.

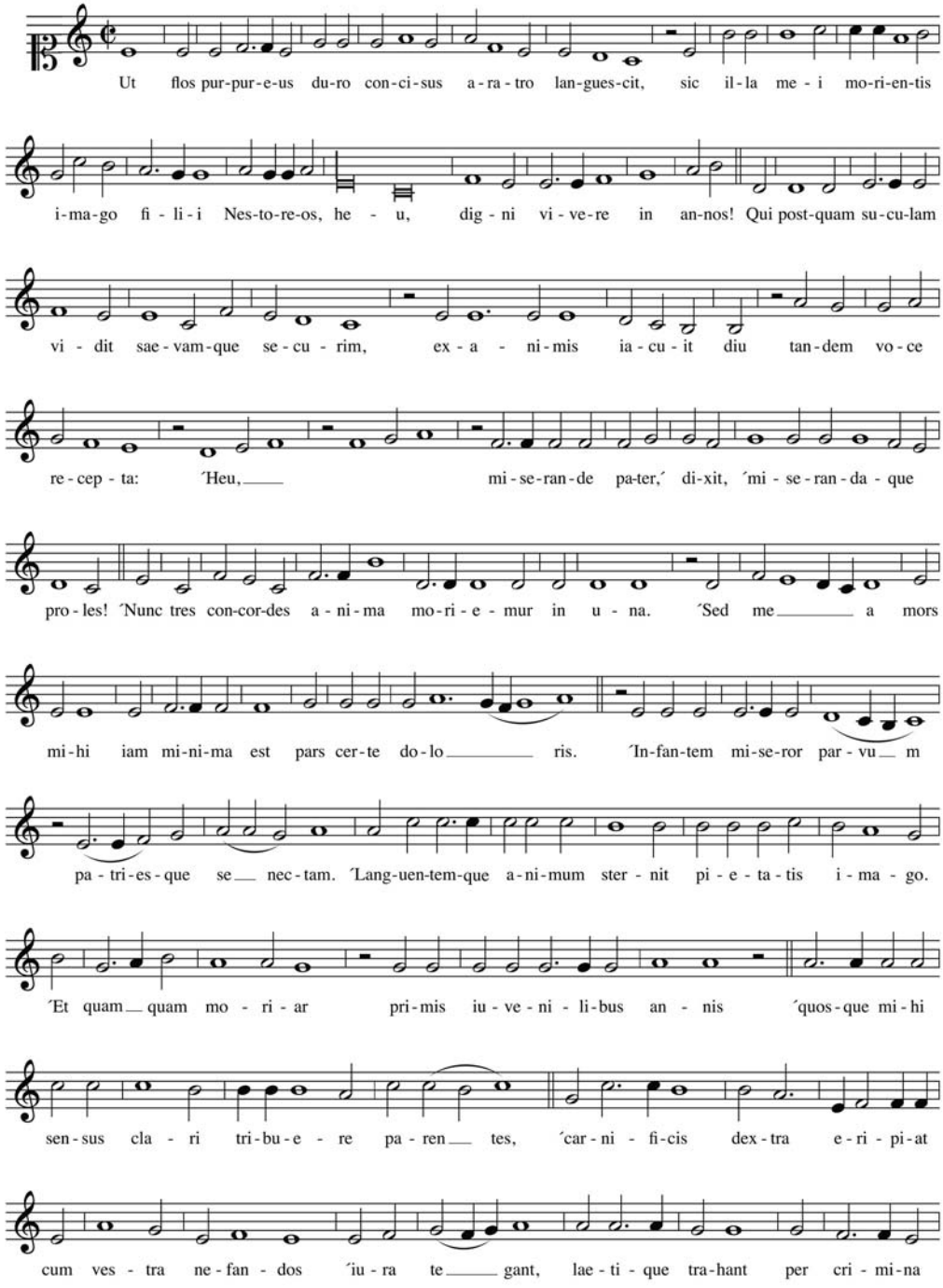
But Cardano's heartfelt plea for the idea that music has a more powerful influence on the human soul than anything else did not convince everyone. His opponent Julius Caesar Scaliger objected:

> I beg you, Cardano, explain yourself. Please don't disappoint our hopes. Why does sound stimulate a human being [more than anything else]? . . . After all, each sensory stimulus alike stimulates the latent power of a sense to produce a corresponding reaction, especially in the case of the sense of taste. Yet this happens even more powerfully in the case of sexual arousal.
>
> (Julius Caesar Scaliger, *Exercitationes exotericae*, exercise 302, 381r)

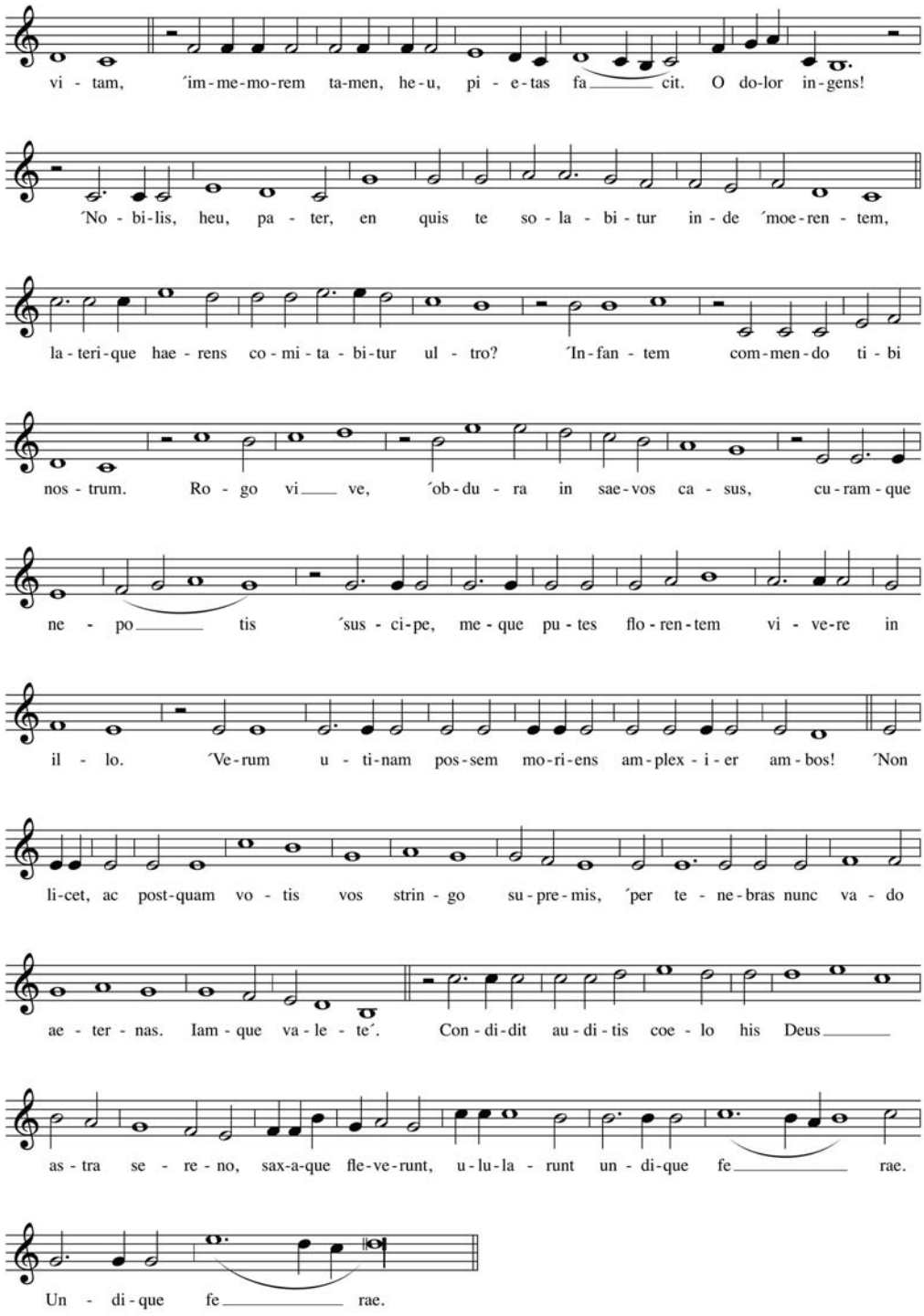
Ultimately, Cardano and Scaliger initiated a debate on the question of whether music or sex arouses human beings more that continued for centuries and still haunts us.

Conclusion

Cardano's writings on music contribute to the larger question of how ancient ideas about music psychology and therapy were studied and reformulated in Italy in the sixteenth century. He redefined the relationship between music, mind and well-being in terms of the two principal functions which the Greek ascribed to music: on the one hand *mimesis* (the imitation of an external



Music example 4.1 Transcription adapted from Girolamo Cardano, "Lament," taken from *De tranquillitate*, *OO* 2.3, pp. 346–347



Music example 4.1 continued

or internal reality) and on the other *catharsis* (the purification of the soul through the affective experience of the purgation of disturbing passions to induce a tranquil state of mind). In this regard, Cardano's writings bear witness to the extent to which the subjective musical experience started to take on legitimacy and intellectual authority in Renaissance thought. In his view on these subjects the disciplines of philosophy, ethics, music and medicine were merged. Above all, Cardano wrote the passages concerned with health as a harmony and music's power to influence the passions of the mind from a fundamental preoccupation with a long, virtuous and happy life. Following the tradition, music as a means to cultivate and harmonise the human spirit could either have a beneficial or detrimental effect on the human body and soul. Yet in contrast with some of his famous predecessors, he was aware that the virtues of goodness and truthfulness did not automatically lead to a harmonious and healthy life and therefore he looked for ways to remedy the capricious laws of human fortune.

Increasingly, Cardano began to answer the question of why listening to music can deeply influence the hearer's passions of the soul, health and morals in physiological terms. Furthermore, he made efforts to substitute explanations in subjective terms of human passions, mental states and musical effects for supernatural and religious explanations of music's power. He was one of the first to acknowledge that a certain type of music would not necessarily lead to a similar passion, but that sad music, for example, could lift someone's spirits and thereby brighten up someone's mind (On the uplifting effects of sad music, see Eerola's and Taruffi and Koelsch's discussion of "Paradoxical sadness" in this *Companion*).

Cardano wrote about health as a harmony and about the power of music from a normative perspective of the goal of a wise person who is aiming for peace of mind unhindered by disturbing passions. In Cardano's view, a wise person who cared for himself had a learned and virtuous mind, a healthy body and an amiable personality. He enjoyed the good and pleasant things of life and exhibited moral integrity in all his acts. Consequently, such a person would search for ways in which music could be used to achieve happiness and security in life, by trying to understand how it could induce temperance and pleasure in the human mind. Calming the nerves or, in Cardano's terminology, the musical cultivation of a tranquil spirit, ultimately was part of an active kind of knowledge about the art of living well.

Cardano's ideas about the musical cultivation of a tranquil spirit bear witness to a process of secularisation that emerged in Italy in the sixteenth century, during which the art of living well was increasingly dealt with in Humanist rather than Christian terms (Rice, 1958, p. 73.) A tranquil spirit was no longer seen as a gift of God, but as a virtue one could achieve by oneself, for example by making and listening to music. Despite the obvious flaws and weaknesses in Cardano's writings on music, his influence was substantial in seventeenth-century English theories of health as a harmony and the power of music, as we will see in the next chapter (See also Gouk, 1991). Strikingly, Cardano's ideas about tempering the passions of the mind and the pursuit of happiness and well-being also influenced modern observers such as Carl Gustav Jung (Prins, 2017a).

Finally, an important point needs to be made regarding Cardano's conception of the human soul and its passions, which is that he did not conceptualise it as an "extension-less" mind, as Descartes later would do in his *Meditations* (Descartes, 2001, pp. 71–90). He saw a human being as a created and intentional whole, in which the whole body was animated by different kinds of spirits which were linked with the passions of the soul. Consequently, Cardano's soul-body dualism was not the same as mind-body dualism, nor indeed was it for Plato, for late ancient Platonists or for medieval and Renaissance thinkers before Cardano, as demonstrated by Pelosi and Hicks in this *Companion*. For Cardano as for his predecessors, music could have effects on the human soul by means of the spirits involved in the mechanism of hearing in ways that "mind" could not in the Cartesian tradition. However, this blurring, to modern eyes, of the metaphysical and the physical, became a serious problem for Cardano. Consequently, he occupies an important place in the history of

conceptions of music, mind and well-being, because he reformulated metaphysical theories of music's effect in terms of the physiological and the affective. In this regard, he became an important link in a long history of attempts to rescue the miraculous power of Greek ancient music on the human soul and to reformulate it according to the new scientific standards of a new era.

Notes

1 For a translation of Cardano's *De musica*, see Miller (1973). For a translation of Cardano's *De subtilitate* [*OO* 3.2], see Forrester (2013). On Cardano's thought see Giglioni 2013, on Cardano's music theory, see Giglioni (2008, esp. 218–219, n. 49) for bibliographical references; Moyer (1992, pp. 158–168); and Schütze (2001).

2 On Cardano's ideas of wisdom, see Rice (1958, pp. 165–176); on his ideas about consolation, see McClure (1991, pp. 161–163). *De consolatione* was translated into English as early as in 1573 in *Cardanus Comforte into English and published by commandement of the right Honourable the Earl of Oxforde*.

3 For this tragic episode in Cardano's biography, see, for example, Cardano (1962, cap. 27, "The disasters of my sons," pp. 92–95 and cap. 41, "Concerning natural though rare circumstances of my own life. The avenging of my son," pp. 189–199).

4 For Plato's and Aristotle's concepts of musical ethos, see Anderson (1966, resp. pp. 64–110 and 111–146).

5 A theory of the mortal parts of the soul as part of a larger conception of man as a harmonic being is given in Plato's *Timaeus* 69a–72d. For the historical evolution of the concept of spirit (*pneuma*) see Verbeke, 1945).

6 Cardano is referring in this context to Problem 30.1 on melancholy in the pseudo-Aristotelian *Problems*, which became a very famous doctrine in the Renaissance through Marsilio Ficino's praise of melancholy in his *Three Books on Life* (*De vita triplici*, 1489). See Ficino (1989, pp. 21–24).

7 The title of this chapter is taken from this quotation.

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De sanitate tuenda (1560). (*OO* 6.2).

De sapientia (1544). (*OO* 1.19).

De subtitlitate (1550). (*OO* 3.2).

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5

MELANCHOLY, MUSIC AND THE PASSIONS IN ENGLISH CULTURE AROUND 1600

Penelope Gouk

Introduction

In the decades around 1600 it was a literary commonplace in England that music moves the passions, the presumption being that music's power to alter people's feelings and behaviour was chiefly due to its effect on the invisible and highly volatile "spirits" that flowed through the nerves and blood vessels and acted as the fundamental link between body and soul.[1] A number of theological, medical and musical writings of the period address what we would describe as music's physiological effects – including its effect on the emotions – even though they used "passion of the soul" rather than "emotion," a term that only came to have its modern meaning in the late eighteenth century (Dixon, 2003; Gouk & Hills, 2005; Richards, 2005). These texts show that in the period under discussion there were contrasting theories about the causes of music's power over the passions (or affections, as they were also called) and its particular relationship to melancholy. Most of these theories were derived from Italian sources and particularly from the natural magic tradition, which with its Neoplatonic underpinnings not only provided a vocabulary to explain musical experiences but also offered an understanding of how music contributes to well-being (on Renaissance conceptions of music and the passions of the soul, see Prins in this *Companion*).

In this chapter I will review these theories, paying particular attention to music's relationship to melancholy as both a cause and a cure for this affliction, which at the time seemed to be widespread in élite society among men as well as women (Babb, 1951). Certainly the cult of melancholia was fashionable in courtly circles around 1600, a mode of being in the world and a form of self-fashioning that could effectively be expressed through and alleviated by "sad" music (Gibson, 2007; Wells, 1985). As can be learned from surviving manuscript and printed sources of the period, such music mostly took the form of ayres (i.e., solo songs accompanied by the lute, either the singer's own or another player's), but also included purely instrumental pieces. One of the most famous examples of this latter form of composition is the lutenist and composer John Dowland's *Lachrimae or Seaven Teares figured in Seaven Passionate Pavans, with Divers other Pavans, Galiards and Allemandes, set forth for the Lute, Viols or Violons, in Five Parts* (1604). What is striking about this work is that Dowland seems to be acutely aware that "sad" music can make people happy (on the seeming paradox of sadness in music, see Eerola's chapter in this *Companion*); he wrote in his dedication to Queen Anne of Denmark, the consort of James I:

> And though the title doth promise teares, unfit guests in these ioyfull times, yet no doubt pleasant are the teares which Musicke, neither are teares shed always in sorrowe, but sometime in ioy and gladnesse.
>
> (Dowland, 1604)

In the process of this examination I will focus particularly on Dowland's strategic use of melancholy, both as a resource for developing his artistic persona and as inspiration for a number of his vocal and instrumental compositions. Dowland (1563–1626) was one of the foremost musicians of his time and his *First Booke of Songes or Ayres* of 1597 was the most successful of all Elizabethan music publications, going through four more editions between 1600 and 1613 (Greer, 2004; Poulton, 1972). The *First Booke* contains his immensely popular *Flow my Teares* [*Lachrim pavan*] which, as will be shown below, was the first of a string of "melancholic" compositions and effectively became his signature tune. It is well known to music historians that Dowland publicly identified himself as constitutionally melancholic (for example, he titled one of his pieces "semper Dowland, semper dolens," i.e. always Dowland, always doleful), but the significance of this manoeuvre has become a subject for debate, notably between two authors whose arguments are discussed more fully below (Rooley, 1983, 2010; Rupp, 2003). In the process of evaluating these contrasting viewpoints I will also consider the contribution of Dame Frances Yates to our understanding of the cult of melancholy around 1600 and what she may have overlooked that is important to us here (Gouk, 2005; Yates, 1972, 1983). Finally, as well as exploring early modern thinking on music's effects on the passions and the human body, this chapter will show how these beliefs resonated with wider understandings of the social and political body.

Music, the Passions and the Natural Magic Tradition

Rather than any physician or music theorist, the best-known contemporary writer on music and the passions was William Shakespeare, whose *King Lear*, *Pericles*, *The Tempest* and *Twelfth Night* show characters cured of low spirits (melancholy) on the one hand or mania on the other with the help of music, a magical and transformative process that unfolded before the eyes and ears of theatre-goers and aroused their wonder (Hoeniger, 1984, 1992). Although there is no contemporary evidence for English physicians actually prescribing it as a therapy, music around 1600 was nevertheless recognised by some writers as having a role to play in managing the passions and in maintaining the harmony between body and soul, a balance that according to traditional medical theory based on the writings of Galen (130–210 AD) signaled good health and well-being (Finney, 1961; Gouk, 2000; Kassler, 1995). At its simplest level Galenic doctrine taught that health was predicated on maintaining a proper balance between the four humours in the body and also on regulating the passions of the mind. Melancholy was normally thought to be due simply to having too much black bile (i.e. melancholy) in the blood, which could be treated by a combination of appropriate medicines and a proper diet. However, thanks to the influence of the Renaissance Neoplatonist Marsilio Ficino (1433–1499) an ancient concept of a more attractive kind of melancholy was revived, a disease that afflicted philosophers and scholars as a by-product of their intellectual life. (Prins, 2014; Prins in this *Companion*; Walker, 1958). In due course the tradition that Ficino first established in Renaissance Italy became more widely known through the publication of "Three books of occult philosophy," the *De occulta philosophia libri tres* (1533) of Heinrich Cornelius Agrippa (1486–1535). This magical-philosophical tradition came to provide both a conceptual framework and a language for those who wanted to describe and make sense of musical experience and its effects on the passions, effects that could be remarkable and beyond everyday norms. It was this sense of wonder, coupled with the perception that music worked its effects at a distance that caused

music or harmony, to be recognised as a form of natural magic that involved the harnessing of hidden or occult forces by purely natural means (Gouk, 1999; Tomlinson, 1993).

Perhaps not surprisingly, we find certain élite musicians identifying themselves (or being identified by others) with this magical tradition, since it implicitly raised their status and indeed that of the art of music itself. The first source to identify the conjunction between melancholy, politics and the arts was the pseudo-Aristotelian *Problems* 30.1, but again it was mainly thanks to Ficino that music in particular became linked to melancholy in the early modern period.[2] As mentioned already above, the best English example of a musician drawing on this rich cultural resource is Dowland, who spent the last decade of Queen Elizabeth's reign angling for a job at the English court, a position which eluded him until James I finally appointed him as one of the King's Musicians in 1612. For Dowland, the crucial feature of the natural magic tradition was that the musician-cum-magus who used music therapeutically for himself and others inevitably suffered from a kind of inspired melancholy, an affliction that resulted from his body using up too much spirit in the process of artistic and intellectual creativity.

Passions, the State and Society

Despite the appeal of an all-encompassing Neoplatonic explanation for music's wonderful effects, it was by no means the only resource available to English writers in the decades around 1600. Indeed, not all writers believed that music's marvelous powers and effects should be celebrated. For some critics, it was precisely because music did have such strong effects on the passions that they thought it should be controlled or even banned altogether. Such a radical stance could be traced back as far as Plato's *Republic* in which the philosopher argued for drastically limiting the kinds of music that were allowed in his ideal state. Aristotle and his followers, however, adopted a more tolerant position, particularly in the context of theatre music (Barker, 1984, pp. 124–163, 170–182; Pelosi in this *Companion*). This debate as it played out in early modern England had its immediate origins in the sixteenth-century Reformation, in which music's place in public worship (that is, in the form of polyphonic settings of the mass with instrumental accompaniment) was severely challenged by followers of John Calvin (1509–1564) the Genevan reformer (Garside, 1979; Vendrix, 2011). These reformers, who were afraid of demonic musical magic as advocated by Ficino, were also against public theatres, which were similarly condemned on the grounds of having a bad effect on people's morals. In England this campaign followed on from Henry VIII's Dissolution of the monasteries, one consequence of which was the dispersal of choristers and musicians. Although the country's cathedrals, some Oxbridge colleges and the Chapel Royal continued to celebrate mass with polyphonic music there was a general loss of morale among musicians in the 1570s as inflation increased and these surviving institutions felt increasingly threatened (Gouk, 1997; Le Huray, 1978).

It is against this background of uncertainty and perceived decline of a great musical tradition that the so-called "Golden Age" of English music emerged in the 1580s and continued until the Civil War, a period that witnessed a remarkable flowering of sacred and secular compositions that were celebrated at the time as well as by later music lovers, critics and historians. One of the factors that contributed to this development was the material and moral support that Elizabeth I provided for her élite musicians, both the Gentlemen of the Chapel Royal as well as members of the King's Music (Holman, 1993). For example, she was willing to patronise the composer William Byrd (1540–1623) despite the fact that he was a known Catholic at a time when they were persecuted. Another factor was the increase in the number of aristocrats and gentry willing to pay for musical goods and services, which included instrumental and singing lessons for those who wanted to play music by themselves or with their family and friends (Price, 1981; Woodfill, 1953). It was this domestic market that Dowland successfully tapped into, the full title of his first publication, for example, indicating how his pieces were flexible enough to accommodate different numbers of

musicians using a variety of instruments; that is to say, *The First Booke of Songes or Ayres of foure partes with Tableture for the Lute: So made that all the partes together or either of them severally may be song to the Lute, Orpherian or Viol de gambo* (London, 1597).

Private music developed intensely after the Reformation, since from a Protestant viewpoint it was considered an appropriate domestic activity for godly citisens, while for Catholics it was the only way that musical worship could function in secret and the means by which recusants could maintain their Catholic identity. The Protestants favoured psalm-singing as their music of choice, a practice that the musician Thomas Ravenscroft extolled for its efficacy in *The Whole Booke of Psalms . . . Also: A Briefe Abstract of the Prayse, Efficacie and Vertue of the Psalmes* (1621) by observing that

> The singing of Psalmes (as say the Doctors) comforteth the sorrowful, pacifieth the angry, strengtheneth the weake, humbleth the proud, gladdeth the humble, stirres up the slow, reconsileth enemies, lifteth up the heart to heavenly things and uniteth the Creature to his Creator, for whatsoever is in the Psalmes, conduceth to the edification, benefit and consolation of mankind.
>
> (Ravenscroft, 1621, sig. A4)

Meanwhile for Catholics the priority was to preserve existing sacred music, the conservation of the Latin and Italian music traditions being considered very important. Also they were likely to encourage the composition of new semi-liturgical works, like the psalm-motet, which could be cultivated in religious retreats and country halls. Notably, as anti-Catholic sentiment reached new heights there was a sense of loss, sadness and despair within this embattled minority and this was reflected in their music-making. Thus, for example, William Byrd published his *Psalmes, Sonets & Songs of Sadness and Pietie, Made into Musicke of Five Parts* (London, 1588) with his Catholic patrons in mind, while at the same time Robert Devereux, the second Earl of Essex (1565–1601) became identified as a noble (possibly Catholic) melancholic who not only composed lyric verses himself but had John Dowland set his melancholic words to lute accompaniment. The solo lute was extremely fashionable at this time and seems to have served as an instrument for consolation or as a companion that could be turned to in the face of despair. An indicator of its popularity is that almost thirty printed lute song books were published in England between 1597 and 1622.

With this kind of patronage network in place we see the emergence of composers of the highest quality, for example Byrd and his pupil Thomas Morley (1558–1602), as well as a significant number of less well-supported musicians seeking remuneration and recognition for their compositional and teaching skills, an early example being Thomas Whythorne (1528–1595) (Osborn, 1961). Not accidentally, this revitalisation of music coincided with an increase in music printing and music book publishing, which in turn was part of a more general expansion of the book trade in this period (Krummel, 1975). Indeed, one of the reasons why from a twenty-first-century viewpoint there seems to be a dramatic increase in the quantity of music being composed in late Elizabethan and Jacobean England is that more of it was being printed than ever before, along with books about music. At the same time there were other texts published in this period that in some measure addressed music's properties and powers (Herissone, 2000). It is perhaps not surprising to find a consensus emerging from all these sources, namely that music (if used properly) is intrinsically a good thing, a belief that is still dominant in many modern studies (see, for instance, Fancourt and – for a discussion of music used "improperly" Brauer in this *Companion*).

Moving the Passions Through Music

Two books that vigorously championed music's value for individuals and society as well as justifying the place of polyphonic music in worship were the anonymous *The Praise of Musicke* of 1586 and

John Case's *Apologia Musices* or defence of music that went to press in 1588 shortly after the defeat of the Spanish Armada. Both these sources are invaluable for their discussions of the wide range of music's properties and the effects that it can have, a topic that went back to Antiquity but as we have seen still had currency in early modern Europe. Indeed, it is clear that Girolamo Cardano's theories of music's powers were familiar to English authors in our period (see Prins in this *Companion*). Another influential text that included reflections on music's powers was the Jesuit Thomas Wright's 1604 edition of his *The passions of the mind*. His book marks the beginning of a shift away from predominantly religious discussions of the passions in England toward medical and natural philosophical discourses, which thanks to Francis Bacon (1561–1626) and René Descartes (1596–1650) in particular came to predominate in the later seventeenth century (Dixon, 2003). Although it lies outside the time frame of this chapter, Descartes's highly influential book on the passions of the soul, his *Passions de l'âme* (1649) should be mentioned here because of its emphasis on the nerves as the transmitters of the "animal spirits" that connected the body to the soul via the brain, their windlike movement giving rise to passions. In fact rather than presenting something entirely new in his book, he put a mechanical gloss on the existing Galenic system. Descartes took the position that music is a physical stimulus that through its mechanical interaction with the sense organs moves the spirits and thereby engenders a pleasurable state (Kivy, 1990).

Some 45 years before Descartes reduced perception to a series of mechanical interactions, Wright's *Passions of the mind* expounded the doctrine of the passions and affections, among other things providing a guide to identifying these inner states through their outward signs and the means of moderating them through reason (Gouk, 1991). Wright's treatment of the passions was not wholly original, but being in the vernacular presumably gave wider access to this doctrine in England. The most influential medieval authorities for Wright's treatise were the theologians St Augustine and Thomas Aquinas. In their worldview the passions (like appetites) were conceived of as involuntary movements by the animal spirits, a fine substance that was diffused throughout the body via the nerves and acted as the instrument and agent of the higher or rational soul. We have seen that this conception of the passions as motions of the spirits or "sensitive soul" was still held in the seventeenth century, for example by Thomas Willis (Gouk, 1991). In principle the affections differed from the passions in that they were voluntary movements of the rational soul, especially toward God, but Wright does not always make this distinction clear and tends to treat them interchangeably. He explains that the passions are named as such "because when these affections are stirring in our minds they alter the humours in our bodies, causing some passion or alteration in them." In other words, they either function as perturbations that trouble the soul and seduce the will or alternatively they can produce good when moderated by reason (Wright, 1604, pp. 7–11 (8)).

According to Wright, music is one means by which the passions can be aroused or moderated and in this respect it is related to the arts of oratory, rhetoric and drama, all of which are linked to music by virtue of their mimetic function (see Pelosi and for a modern view Loutrari and Lorch in this *Companion*). As a Jesuit priest Wright was keen to support the argument for the use of music in religious contexts, believing that the pleasure of the senses could lead toward devotion rather than simply debauchery. Indeed, he argued that music is divine in origin and that it can be used to elevate the mind to devotion, to prepare the spirit to receive prophecy and to lead to ecstasy, that is union with the divine. Admittedly it could also be used for dissolute levity and lascivious purposes, but he thought that the fault was not in music itself, but in the wickedness of some musicians and the general weakness of mankind (Wright, 1604, pp. 159–172).

Although Wright wrote from an explicitly religious standpoint, his understanding of music and its power distinctly resembled ideas previously expressed in *The Praise of Musicke* and in Case's *Apologia*. All three authors agreed that music has a special relationship to the passions. For example, in the second chapter of *The Praise of Musicke* the author addresses "the dignitie of Musicke" where

he asserts that the three causes of music are pleasure, grief and finally divine and heavenly inspiration and goes on to observe that the affections have a "natural kind of propension" with music because they are both forms of motion. To sum up this passage, he states: "The chiefe end of Musicke is to delight, howsoever sorrow useth it sometimes for an advantage as knowing how forcible and effectual it is to help forward al purposes" (Anon, 1586, p. 35).

Furthermore, in the fourth chapter titled "The effects and operation of musicke" the author says that music has an agreement with our nature, which is the cause of pleasure and delight and that ultimately this delectation is "also the cause of those effectes which it mayketh as well in the minds as bodies of them that heare it" (Anon, 1586, p. 54). In fact it emerges that music doesn't only move particular passions, which lie midway between sense and reason, but also has effects on the body and especially the higher cognitive faculties, this being due to the similarity between the soul and musical harmony. Meanwhile Case in his *Apologia* spends some time arguing that music is particularly necessary for those who lead a contemplative life, as well as observing that it has a role to play in soothing evil passions and procuring good morality (Case, 1588, p. 51).

Taking a look across all three sources, some of the passions most closely associated with music seem to be anger and rage, temperance, courage and chastity, pity and compassion, pleasure and delight and mirth and melancholy, but this is by no means an exhaustive list. However, one of the reasons why these are mentioned in particular is because they were among the effects associated with certain musical "modes" that according to the Plutarchian text *On Music* (third or fourth century A.D.) were in use in Greece and surrounding nations in Antiquity (Barker, 1984, chapter 15). Although early modern authors who read this work had no idea what these "modes" sounded like (indeed they confused them with the medieval church modes), they knew from ancient and medieval authorities (e.g. Plato, Ptolemy and Macrobius) that they were distinguished according to the operations that they worked in their listeners, although there was not total agreement on which mode was associated with a given ethos. What mattered was that there was a correlation between the disposition of the listener and the character of a particular mode, the assumption being that if the mode changed then his or her mood and behaviour changed accordingly (Palisca, 2006, especially chapter 10). Thus, for example, as explained in *The Praise of Musicke*, there was the Dorian mode, "a grave and staied part of musicke" which was "a giver of wisdome and a causer of chastity"; the Lydian, which being used in comedies was "more lighter [sic] and wanton" than the Dorian; the Phrygian which with "great force and violence" provoked courageous and warlike feelings; and the Myxolydian which expressed "melancholy and doleful affections" (Anon, 1586, p. 55). Not surprisingly, Plato had stated that only the Dorian and the Phrygian were to be allowed in his ideal *Republic* 398C–403C (see also Pelosi in this *Companion*).

Drawing inferences from what these early modern authors had to say about ancient times, we can see that they were thinking about music's effects on the passions in two distinct but complementary ways. In the first place there was the assumption that music can serve to enhance or heighten an existing passion (homeopathically), while in the second it can be used to change this state (allopathically). Thus, for example, we may use

> Musicke as a medicine for our sorrow and a remedy for our griefe: for as everie disease is cured by his contrarie, so musicke is as an Antipharmacon to sorrow: abandoning pensive and heavie cogitations, as the sunne beames do the lightsome vapors . . . Musicke aswageth and easeth the inordinat perturbations and evill affections of the mind.
>
> (Anon, 1586, p. 61)

Thomas Wright in his *Passions* says that "Musick . . . mooveth men to mirth and abateth the heavy humour of Melancholie" but goes straight on to wonder why in certain cases it also causes melancholy

(Wright, 1604, p. 163). This was in part answered by Robert Burton, who in his *Anatomy of Melancholy* of 1621 observed:

> Many men are melancholy by hearing musicke, but it is a pleasant melancholy that it causeth and therefore to such as are discontent, in woe, feare, sorrow or dejected, it is a most present remedy, it expells cares, alters their grieued minds and easeth in an instant.
>
> (Burton, 1977, p. 375)

Theories of Hearing and Responding to Music

Having established from a mix of early modern and ancient examples that different kinds of music have discernable effects on how people feel and behave, how did contemporaries explain such effects around 1600? How did they understand the process of hearing in general? There are few English sources that say anything about the causes of music's powers in a way that we would find scientifically persuasive. Thus, for example, although the anonymous author of *The Praise of Musicke* touches on quite a wide range of effects he says little about their causes, beyond remarking that we are allured with music because it has a "hidden vertue" that exists between our souls and music, which has a certain "divine influence" on the souls of men

> whereby our cogitations and thoughts . . . are brought into a celestial acknowledging of their nature . . . Musical concent being like that Harmonical motion which he [Aristoxenus] calleth the soule, doth most wonderfullie allure and as it were ravish our senses and cogitations.
>
> (Anon, 1586, p. 41)

Just as the musical scale is made up of three proportionate intervals (in modern terms the octave 1:2, fifth 2:3 and fourth 3:4), so the soul is divided into three parts or faculties which correspond to these intervals, this correspondence between proportions being the reason why different mixtures of music can have particular effects on different individuals and societies.

This argument, which we would consider pure speculation, was based on the ancient tradition of the harmony of the spheres that (as Hicks explains in his chapter in this *Companion*) went back to Plato and beyond, but was infused with fresh life in the Renaissance thanks to the efforts of Ficino (Prins, 2014; see Prins in this *Companion*).

There were other ancient sources besides those dealing with natural magic that provided inspiration for early modern theorists. For example, Wright followed the Aristotelians in his classification of the passions according to whether they are pleasurable or painful in nature and in his explanation for their physical effects on the body. In the first case, where the object is pleasurable, the animal spirits flock from the brain, the seat of the sensitive soul, via certain "secret channels" to the heart, the seat of the passions, which thereby becomes dilated. Conversely, a painful appetite leads to the contraction of the heart and the gathering of "melancholy" blood around it, leading to an imbalance of the humours and mental disquiet (Wright, 1604, p. 45). Reason, however, can modify the exaggerated effect of the passions.

As was increasingly recognised, for example by Francis Bacon, Aristotle and his followers had shifted attention away from the secret power of numbers to the sensible properties of sound and hearing as a basis for understanding music's power over the soul. Indeed, Bacon characteristically dismissed the magical tradition outright and instead proposed a more grounded experimental method for investigating the causes of music's effects that was based on Aristotelian models (Gouk, 1999, pp. 157–178). Nevertheless the concept and language of "spirits" and "sympathy" still remained fundamental to Bacon's conception of the universe and his belief in man's ability to harness forces

within it without recourse to higher powers. Thus in his *Sylva sylvarum* of 1627, which included guidelines for learning about the nature and properties of sound, he observes that

> *Harmony*, entring [the ear] easily and Mingling not at all and Comming with a manifest Motion; doth by Custome of often Affecting the *Spirits* and Putting them into one kinde of Posture, alter not a little the Nature of the *Spirits*, euen when the Object is remoued. And therefore we see, that *Tunes* and *Aires*, euen in their owne Nature, haue in themselues some Affinity with the *Affections* . . . So as it is no Maruell, if they alter the Spirits; considering that *Tunes* haue a Predisposition to the *Motion* of the *Spirits* in themselues. . . . We see also that seuerall *Aires* and *Tunes*, doe please seuerall *Nations* and *Persons*, according, to the Sympathy they haue with their *Spirits*.
>
> (Bacon, 1627, §114)

In fact Bacon's leaning toward the investigation of the physical nature of sound was anticipated, for example, by a few sixteenth-century scholars such as Cardano. Wright, for example, offered four competing explanations for the power of music, the first of which admittedly was "a certain sympathy, correspondence or proportion betwixt our souls and music"; but this he discarded in favour of a more sense-oriented account that simply said that the ear has many objects that delight it and that in music "divers consorts" stir up the heart, there being diverse sorts of joys and diverse sorts of sadness or pain (Wright, 1604, pp. 168–171). The anatomist Helkiah Crooke in his *Microcosmographia* (London, 1615) similarly rejected the Platonic idea that the effects of music were the result of an inherent harmony between the soul and music. Instead he appealed to the authority of the Aristotelian *Problems*, which stated that it is proportion that delights the senses and the mind (Barker, 1989). Crooke also explicitly followed the thinking of J. C. Scaliger, who explained that music affects the listener because the spirits about the heart take in trembling motions of music and are stirred up (Crooke, 1615, p. 698). In sum there was little attention paid to the anatomical structure of the ear in most explanations of music's effects at this time. Bacon, for example (as we can infer from the above quotation), envisaged musical sound as a form of moving air that simply enters the ear and sympathetically alters the movement of the spirits, which in turn affects the passions.

Music and Melancholy: A Case Study

At this point it seems appropriate to consider music's special relationship to the passion of melancholy, especially its capacity to both cure and cause this disease. As a way in to this topic we need look no further than to *A treatise on melancholie* that was published in 1586 by the physician and later pastor Timothy Bright (1550–1615). This was the first book in English to deal with the subject and as such had a strong influence on later treatments including Burton's *Anatomy of Melancholy* of 1621 (Gouk, 2013). Bright tells readers that he wrote his treatise to persuade his friend "M" that melancholy was not a form of soul sickness that results from sin but instead was the "natural" kind of melancholy that comes from disorder within the body and is therefore responsive to physic (i.e., medicine). In order to explain how melancholy can affect people even if they have not sinned he claims the existence of an extremely fine spirit that flows through the body and acts as the soul's instrument. According to Bright, this singular spirit is moved by an inward, forcible power that is sufficient to account for all life functions and bodily actions. His point is that the human body can malfunction and lead to a problem with the transmission of the spirit, which relies on its free-flowing movement to keep the body healthy. Melancholia, which results from a lack of spirit in the blood caused by an imbalance of the humours and a corresponding superfluity of black bile (i.e., melancholy), is one disease that can be caused by the body malfunctioning rather than being the outcome of a deliberate act of sin.

Bright's *Treatise* is also noteworthy for its remarks on music's capacity for calming the mind and as a cure for melancholy. Significantly he remarks that music acts like a "magical charm" on the minds of men and that the agreement between the consent of music and the affections of the mind is the reason why "wise lawgivers in time past" (e.g. Plato) allowed certain kinds of music but rejected others as "hurtful to their common wealths" (Bright, 1586, p. 241). Bright then goes on to describe specific musical forms as being appropriate for curing particular distempers, in a way that perhaps demonstrates a familiarity with the particular types of music to which he alludes. The striking thing is, he was an amateur musician who played the theorbo (a kind of lute) and harp and was therefore in a position to have gained first-hand experience of music's therapeutic potential. First, he states that "solemn music" is best for disordered rage and intemperate mirth, which are symptoms of madness. Specifically he notes the virtues of "dumps" and "fancies," which are particular forms of composition, for their treatment. Dumps were solemn pieces written in memory of a deceased person, while fancies, which were originally imported from Italy, were composed improvisations for lute or keyboard (Ward, 1951). By contrast, Bright claims that "cheerful music" of the kind "as most rejoyceth" is best suited for melancholic ears, especially if it carries an "odd measure," by which I think he means music in triple metre, which has a distinctive rhythmic pattern that should attract the attention of even the most withdrawn person. However, he also observes that if the melancholic has skill in music (i.e., someone like Ficino or Bright himself, perhaps), the wise application of a "deeper harmony" is required for "alluring the spirits, stirring the blood and thinning the humours" in the effort to restore well-being (Bright, 1586, pp. 40–41). Although Bright does not say so explicitly, he seems to think that the movements of the spirits can be repatterned by the particular organisation of the music being heard.

This reference to a "deeper harmony" that is needed to cure someone skilled in the art of music brings us back again to the cult of melancholy, an Italian-influenced fashion which flourished at the English court in the decades immediately after Bright published his *Treatise*. The route via which Ficino's concepts of poetic frenzy and inspired melancholy became familiar to English poets in the late-sixteenth and early-seventeenth centuries has already been explored, notably by Frances Yates in *The Occult Philosophy in the Elizabethan Age* (London, 1983). One of Yates's most important achievements in this book is to have persuasively linked melancholia to the prevailing political and intellectual climate in England and the Continent around 1600. Surprisingly, however, despite locating melancholy within a broader cultural context, she says nothing about music's relationship to this affliction, even though for example Dowland publicly identified himself as a melancholic and composed music for a significant number of melancholic songs.

Indeed, contrary to the impression that Yates gives, the 1590s saw an "explosion" of what Anthony Rooley has identified as "inspired melancholy." This mainly took the form of poems set to music that according to Rooley were intended for the pleasure of a group of melancholic intellectuals and aristocrats who were fascinated with the occult philosophy and its promise of hidden wisdom. This network included the Earl of Essex, who through commissioning music by Dowland for his poetry sought to communicate to Queen Elizabeth his deep despair at being banished from courtly life (Rooley, 1983).

However, Susanne Rupp questions Rooley's assumption that Dowland was actually part of such an esoteric coterie himself and the importance that Rooley places on the musician's mental state for the quality of his compositions. Instead she argues that Dowland's self-presentation as a melancholic was essentially pragmatic and that his main goal in expressing his suffering through music was simply to ensure that it was impossible for anyone else to participate in this fashion without reference to him or his compositions (Rupp, 2003). In my own opinion, the difference between these two viewpoints is not so great as it might appear and it is worth trying to reconcile them. On the one hand, it certainly seems the case that Dowland made the most of his melancholic identity in the process of looking for patronage and marketing his songs. On the other hand, while he may have developed

this persona from financial necessity this does not mean he was simply acting a part. What we can say is that he probably "really" did suffer from the disease and that at the same time it had a defining impact on his career. What is indisputable is that the "Dowland phenomenon" spread beyond the confines of the court and made a massive impact on a much wider audience.

According to Rooley, Dowland's song *In darkness let me dwell* (published in *A Musical Banquet* in 1610) is one of the most profound, most sublime and most enigmatic songs of that age (Rooley, 2010). Meanwhile, Dowland's signature lute song *Flow my teares* was easily the most popular composition of the Elizabethan period and might well have been the music that Count Orsino was supposedly listening to at the opening of *Twelfth Night* (written c. 1601–1602) where he memorably commands a musician to play "that strain again! It had a dying fall" (Act I Scene I line 4). This striking image immediately brings to mind the sounds that became Dowland's signature tune; that is, the falling tear motif, starting on an A and descending to an E with the words "Flow my tears" set to it. As is shown in the preceding chapter, this motif was not original to him but had already become an established musical convention in Italy a generation earlier. Cardano had already observed in his *On music* how a series of slow and serious notes dropping downward suddenly from a high range "imitates the manner of those who weep" (see Prins in this *Companion*). Dowland continued to make use of the falling tear gesture in his compositions, most notably in his *Lachrimae or seven teares* (London, 1604), an instrumental collection that included a cycle of seven *Lachrimae* pavans based on the same descending notes.

However, this neat link between tears and falling phrases scarcely does justice to Dowland's profound engagement with melancholy, both as a composer representing/expressing sad or painful feelings through music that at the same time induces pleasurable catharsis and also as an ambitious Catholic sympathiser who failed to land a desirable job as a musician in the English court under Elizabeth I. This situation contributed to the melancholic state that he was in and encouraged his musical exploration of melancholy. In fact, as Molly Breckling has shown in her analysis of his religious-themed music, Dowland implicitly acknowledged four different types of melancholy in his musical *ouevre* (Breckling, 2007). According to Breckling these comprised "true melancholy," i.e. what we would identify as clinical depression; lovesickness or erotic melancholy; melancholy caused by the thwarting of ambition; and, above all, religious melancholy, which thanks to the upheavals of the Reformation seems to have been prevalent in English society at this time (Austern, 2000).

Through careful study of nine lute songs with religious texts and all his settings of psalms and canticles (i.e. songs with words taken from the Bible other than from the book of Psalms), it has been shown that Dowland's music enacted a specific collection of musical gestures to express a consistent conception of religious melancholy (Breckling, 2007, p. 3) These gestures or musical markers include: i) the use of melismas (ornamental phrases of several notes sung to one syllable of text) to highlight specific melancholic and religious words such as "suffering," "sinfull" "sorrows"; ii) the use of rests in the middle of a phrase, which draws attention to the silence itself and to emotionally loaded words nearby, giving the impression of being distracted or overcome with emotion; iii) the use of chromatic writing and dissonance, which appear in nearly all of Dowland's songs but are especially prominent in his later songs of religious melancholy, highlighting for example such texts as "in his grief," "misery and pain" and so forth; and iv) the repetition of a word or phrase, which according to Breckling if it occurs at the beginning of a piece expresses confusion and doubt and if at the end usually gives weight to an important idea (something that Aristotle advised in his treatment of rhetoric). All these musical conventions provided Dowland with an embodied repertoire of emotional representations that show him associating concepts of melancholy and spiritual ideas by means of the same musical gestures. In other words there is a deep connection between religious and melancholic feelings, which are quite difficult to disentangle from each other in the music.

Conclusions

In this chapter I have demonstrated that from the late 1580s onward there emerged a distinct, albeit small, body of printed English texts that highlighted music's power to influence the "passions and affections" of the mind, which included various kinds of melancholy. The passions were entities that were similar to our modern conception of the emotions, although as I have suggested they were still embedded within worldviews that notably differed from those of the present day. For example, around 1600 the soul was still assumed to be a real thing. I have also shown that this printed material appeared in the context of a society in which the value of music was by no means self-evident and the status of musicians was equally questionable. Thus as part of their defence these authors assumed that music was an ethical force for good and constituted part of a broader discussion about music's proper place in worship and in society more generally, a debate that went back to Plato and Aristotle.

This was an inherently interdisciplinary discourse that straddled religion, philosophy and medicine as well as music because it had to take account of the actions of the soul as well as those of the body in order to grasp how music worked its effects, which at times seemed almost miraculous. Indeed, this view of man as a religious creature clearly had implications for the way in which it was thought that music should be used to enhance well-being and happiness. The early seventeenth-century model of man, one that assumes the existence of the soul and its harmonious interaction with the body, is quite different from twenty-first century secular conceptions of the healthy person and how music can affect his or her inner state.

Notes

1 On the background to the concept of spirit or spirits see Verbeke (1945) and C. U. Smith, Frixione, Finger and Clower (2012). On popular as well as élite ideas about the power of music, see Marsh (2010, chapter 1, esp. pp. 50–59).

2 "Why is it that all those who have become eminent in philosophy or politics or poetry or the arts are clearly of an atrabilious temperament and some of them to such an extent as to be affected by diseases caused by black bile, as is said to have happened to Heracles among the heroes?" (*Problems* 30.1 953a10–14). For essential background to my treatment of melancholy later in this chapter, see Klibansky, Panofsky and Saxl (1964).

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6

MUSICAL GLASSES, METAL REEDS AND BROKEN HEARTS

Two Cases of Melancholia Treated by New Musical Instruments

Carmel Raz and Stanley Finger

Introduction

The history of musical instruments and the emotions is long and intertwined, as centuries of philosophical and medical writings make clear (Finger & Boller, 2015; Gouk, 2000; Thaut, 2015). Whether intended to dispel demons, revitalise animal spirits coursing through the nerves, sympathetically recalibrate nerves or simply to lift one's spirits, the effects of playing, listening to, singing with and dancing to musical instruments have remained constant tropes. In this essay, we survey the deployment of two novel music instruments to treat melancholy in the eighteenth and nineteenth centuries. The first is the glass armonica, which Benjamin Franklin used to cure Isabela Fleming Czartoryska in 1772. The second is the aeolodicon, a new keyboard instrument that Peter Joseph Schneider claimed he had used to heal a young Dutch woman named Lina around 1830.

This historical journey will begin with Franklin and his glass armonica, followed by what we know about his patient, his treatment and the outcome. The same sequence will then be followed for Schneider. We shall next examine why both therapists might have decided to use new musical instruments in their treatments, focusing on the medical theories of their times and also the role of suggestion. In closing, we shall examine the common features of these two case studies, linking the increasing interest in instrumental timbre to developments in early-nineteenth-century psychiatry and related disciplines.

Franklin, the Armonica and Princess Isabela Czartoryska

American polymath Benjamin Franklin (1706–1790) was born in Boston. After moving to Philadelphia in 1723, he became a successful publisher and was involved with civic and philanthropic projects including founding a lending library, a non-sectarian college, a large charity hospital and the American Philosophical Society. He would later help establish the first American medical school (Finger, 2006).

Franklin was always interested in natural philosophy and medicine, in part because he was genuinely fascinated by the natural world, but also because the ability to inform readers about medical news was beneficial to him as a newspaper printer. During the 1740s, he became engrossed

in the subject of electricity (Cohen, 1990). His clinical trials on stroke victims and patients with other disabilities led to a better understanding of therapeutic electricity (Finger, 2007). In 1752 Franklin successfully applied mild electricity to a woman's body to treat hysteria and late in his life he recommended electrical shocks to the head for cases of severe melancholia (Evans, 1754).

In 1757, Franklin was dispatched by the Pennsylvania Assembly to London. There he played a leading role at the Royal Society, where he guided new research on electricity, which he increasingly believed could not just be made from machines and captured from the heavens, but was also a property of certain fishes (Finger & Piccolino, 2015). His invention of the glass armonica was a direct result of his interests in all things electrical.

Franklin's first encounter with glass music likely took place around 1758, when he travelled to Cambridge, England to visit the chemist Edmund Delaval, who had been conducting electrical experiments. Franklin discovered that Delaval was also interested in making music by tapping wine glasses filled with different quantities of liquid (Zeitler, 2013). Noticing that musical glasses were in constant danger of breakage, spillage and evaporation, he designed an improved instrument that dispensed with liquids altogether. It utilised 23 glass bowls of different-sizes arranged from largest to smallest on a horizontal rod rotated with a foot pedal (Figure 6.1). The musician's moistened hands simply had to rub the rims of different spinning glasses to produce different sounds. This innovation further enabled the performer to play several notes at the same time. In a 1762 letter to natural philosopher Giambattista Beccaria, Franklin explained that he was calling his new invention the "armonica," drawing on the Italian word for harmony, in appreciation of all the Italians had accomplished in the field of music (Franklin, 1769, pp. 437, 438).

The earliest account we have of Franklin's personal deployment of the entrancing powers of glass music occurred after he returned to Philadelphia in 1762 (Zeitler, 2013). Years later, Leigh Hunt remembered that Franklin "concealed it [the armonica] from his wife till the instrument was

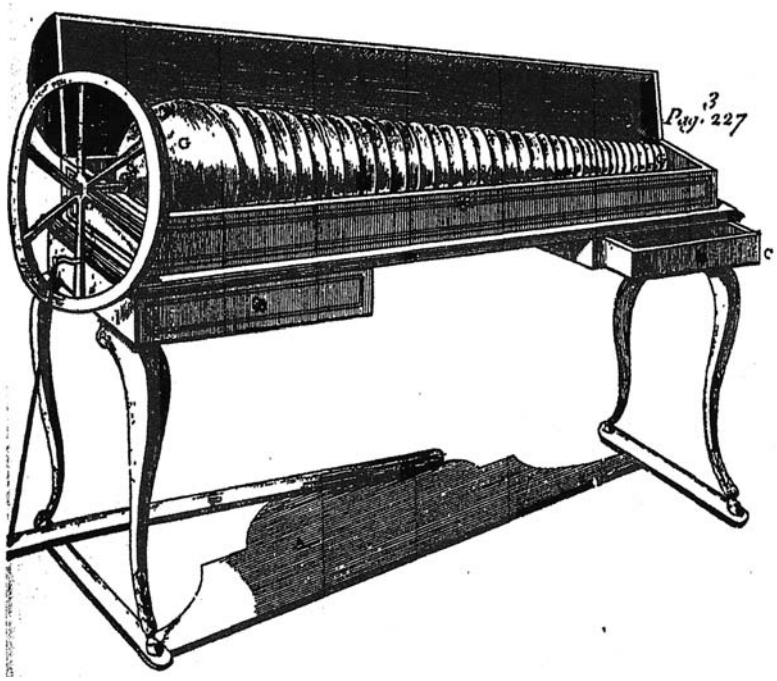

Figure 6.1 Benjamin Franklin's Armonica

Figure 6.2 Isabela Czartoryska in London, 1777, by Giuseppe Marchi

fit to play; and then woke her with it one night, when she took it to be the music of angels" (Hunt, 1850, p. 28). Later the same year, Franklin used his armonica to calm and charm Mrs. Ann Graeme, whose daughter Elizabeth had been jilted by his son William. The details of this meeting are vague, but, as Elizabeth's mother wrote, "we parted with great ease and politeness on all sides" (Gratz, 1915, pp. 269–271).

Two years later, Franklin returned to England representing several colonies in addition to Pennsylvania. He was again active in the Royal Society and in various facets of natural philosophy. Among other things, he now tried to understand the expression of the passions in music. His friend Abbé André Morellet, then in London, might have stimulated this special interest. In 1771, the French cleric published a treatise exploring how music functioned as a metaphorical language for depicting the passions, what we would today call the emotions (Morellet, 1771). He thought that music should not imitate the objects depicted, but rather amplify and heighten their expressive impacts. Morellet maintained that "it is not the truth, but an embellished resemblance that we demand from the arts" (Morellet, 1771, trans. Lippman, 1986, p. 279). Franklin gave Morellet a list of approximately 50 terms related to the passions, such as desire, joy, grief, moroseness and pride, which Morellet then translated from English into French (Cohn, 1993, pp. 312, 313; Lingelbach, 1955, p. 387).

Our record of how Franklin used music to treat melancholia at about this time comes from the memoirs of Princess Isabela Czartoryska (1746–1835), a distinguished writer, horticulturist and patron of the arts (Figure 6.2).

In 1772, Isabela and her husband Adam Czartoryski and her lover, Prince Nikolai Repnin, were in London, where she was stricken with melancholia.

> I was ill, in a state of melancholia and writing my testament and farewell letters. Wishing to distract me, my husband took me to Franklin . . . Franklin had a noble face with an expression of engaging kindness. Surprised by my immobility, he took my hands and gazed at me saying: *pauvre jeune femme* [poor young woman]. He then opened a harmonium [sic], sat down and played long. The music made a strong impression on me and tears began flowing from my eyes. Then Franklin sat by my side and looking with compassion said, "Madam, you are cured."
>
> (Lipowski, 1984, p. 362)

Although the princess initially improved, she soon relapsed and even attempted to end her life by taking poison. Additional unhappy love affairs followed by the tragic deaths of two of her daughters resulted in hysterical paralyses and mental disturbances. This time she was treated with electricity, but whether Franklin was in any way involved with her electrical treatments is uncertain.

Schneider, the Aeolodicon and Lina

Peter Joseph Schneider (1810–1837) was active in both the musical and medical scenes in early nineteenth-century Germany. He lived near Bonn throughout his life and should not be confused with his namesake, renowned physician Peter Joseph Schneider (1781–1871) from Baden.[1] A doctor of philosophy, our Schneider spent much of his brief career passing as a physician, styling himself "Dr," and advertising his services as a healer specialising in speech impediments. He published three books on medical subjects: *Aphorismen über die Cholera Morbus* [*Aphorisms on Cholera Morbus*] (1832), *Fragmente aus dem Tagebuche betreffend meine Methode* [*Diary Fragments Concerning my Method*] (1835) and *System einer medisinischen Musik [System of Medical Music*] (1835).

System of medical music is a veritable *summa* of early Romantic popular understandings of music therapy. The first volume considers the physical, spiritual and social effects of various genres of

music, including operas, chamber music and military music, as well as music's influence on different populations. The second compares the music of various nations, discusses the role of music in childhood education and examines how sound could be employed to treat various conditions, including epilepsy, depression and mania. Much of this book is an assemblage of copiously annotated quotations – some in Latin, Greek, Hebrew and French – bearing lengthy footnotes and digressions. It ends with two detailed case histories depicting the musical cures of a woman with melancholia and a man suffering from psychogenic dysphonia or a hysterical loss of voice. Schneider might have believed these two accounts would attract medically-minded readers to his text, which is otherwise almost entirely compiled from historical sources. In addition to presenting himself as a physician in this work, Schneider tried to enhance his medical credibility by offering evidence of his healing skills and command of the therapeutic powers of music.

Schneider's *System* provides many colourful insights about the musical and medical cultures in early-nineteenth-century Germany (Hensler, 1959, pp. 115–120). He was cavalier, however, when it came to citing the sources of his material. Although his case histories are presented as factual first-person accounts, they are actually composites and possibly even (partially?) fictional. In fact, the musical treatments described in his text are interwoven with passages taken *verbatim* from medical works written by his contemporaries, most notably physicians Christian Heinrich Schreger and Ernst Joseph de Valenti (Raz, 2018). Schneider incorporated Schreger's catalogue of diagnostic questions into his own assessment procedures, but without acknowledging where they originated. Other than a few queries regarding the patient's musical preferences, his list is identical to the latter's *Handbuch der Pastoral-Medicin für christliche Seelsorger* [*Companion to Pastoral Medicine for Christian Pastors*] (1823), a text written for medically-oriented clergymen.

Schneider's use of de Valenti's text is far more perplexing. He extracts details from two of the latter's case histories and interweaves them into corresponding scenarios in which music and musical instruments play a leading role. Importantly, de Valenti's treatments do not feature music in any way: one patient is cured by an emetic and the other by religious counselling and herbal sedatives.

In his *System*, Schneider expands on de Valenti's case histories with abundant musical details. Although he might not have even seen and treated a patient corresponding exactly to Lina, reports in contemporaneous newspapers indicate that he actually did treat some patients, predominantly individuals suffering from speech impediments.[2] Given that his explicit agenda included promoting certain types of music and musical instruments for physical and emotional health, his assignment of an essential role to the newly invented musical instrument – the aeolodicon – is significant.

Schneider claims he undertook a research trip to the Netherlands accompanied by a Dr. Zober, a physician friend, during the summer of 1831. The first patient he treated, he reports, was Lina, the 19-year-old daughter of a Dutch merchant, who was suffering from profound melancholy. Interrogating her parents, Schneider learned that her condition had been caused by the death of Antonio, a young Spanish apprentice, whom she had secretly loved. Her infatuation had developed during the family's regular house concerts, during which the young man, a gifted tenor, had frequently performed arias by Daniel-François-Esprit Auber. Antonio had succumbed to a nervous fever two years earlier and Lina had remained inconsolable. Numerous physicians had attended her, but none had succeeded in alleviating her melancholic state.

Schneider informs his readers that Lina's physical health required immediate attention, as her condition was accompanied by headaches, involuntary tics and indigestion. He first prescribed the cold water cure, which was popular at the time. (It should be noted that the account of Lina's physical symptoms and response to the water cure do not appear in de Valenti's corresponding case history yet might have been partly rooted in fact). After two weeks of the strict hydrotherapeutic routine, her physical condition improved. Nevertheless, her menses did not return and she remained withdrawn. He reports that he next decided to tend to her psychological condition with music.

By claiming that he employed the aeolodicon to treat Lina, Schneider aligned himself within a tradition of healing melancholic patients by means of ethereal sounds. Franklin, as we have seen, treated Isabela Czartoryska with the eerie sounds of his glass armonica some six decades earlier and Franz Anton Mesmer subsequently used Franklin's instrument in his famous séances. By the early 1830s, however, the armonica had gained unsavory associations through its presence in mesmeric practices, which amplified increasingly the widespread belief that its vibrations might cause nerve damage and various pathologies, including insanity (Hadlock, 2000; Kennaway, 2012). For these and other reasons, the unfamiliar sounds of early free-reed keyboard instruments, such as the aeolodicon, began to replace the armonica in music-assisted therapies. There are a number of reports of female patients treated with the sounds of the harmonium during the first half of the nineteenth century and the instrument became increasingly associated with mental suggestion in both medical literature and fiction (Raz, 2014).

A forerunner of the harmonium, the aeolodicon is a portable, keyboard-operated, free-reed organ. Free reeds, typically powered by foot-operated bellows for regulating the air flowing over vibrating tongues encased in a pipe, allow the performer complete control over the swelling and fading of the sound. This quality, hitherto associated primarily with the human voice and novel instruments, such as the armonica or the Aeolian harp, would frequently be described as ethereal or otherworldly (Dolan, 2008). Instrument makers actively sought to cultivate this aura of ethereality, often naming their instruments with references to the heavens.[3]

In his *System*, Schneider reproduced the 1834 entry on the instrument from the *Universal-Lexikon der Tonkunst*, which describes it as follows:

> The aeolodicon is an instrument whose tone is produced when air or wind is conveyed over freestanding metal pipes. The depression of a key opens a kind of valve or wind chest and as the player treads on a bellows, the compressed air streams out and flows over freestanding metal springs or tongues, providing the sound. This affords the creation of very regular and well-balanced crescendo and decrescendo effects, according to the rate at which the air in the bellows flows over the tongues . . . *Furthermore, the tone itself, a kind of ghostly breath, truly has something ethereal in its nature and easily moves certain susceptible minds with its gentle sounds.*
>
> (Schneider, 1835b, p. 266)[4]

The aeolodicon was still relatively new in 1835, which is probably why Schneider described it in such detail. The first foot-operated free-reed keyboard instrument, the *orgue expressif*, had been built by Gabriel-Joseph Grenié in 1809. Less than a year later, German inventor Jean Tobié Eschenbach designed the eoline and aeolodicon on similar principles. Friedrich Kaufmann's choraulodion (1811) and Anton Häckel's physharmonica (1818) quickly followed, as did various other free-reed instruments. Moreover, as historian of science Myles Jackson has emphasised, free-reed technology was a staple of musical automata, as exemplified by Johann Nepomuk Mälzel's panharmonicon (Jackson, 2006).

Schneider describes staging a musical intervention around the sounds of the aeolodicon, with the help of Lina's uncle (an amateur tenor) and three other male singers. He relates that he performed on the aeolodicon while hidden with the singers in an adjacent room out of Lina's sight. Quoting Schneider:

> I began to improvise in E-flat minor, one of the keys corresponding to deepest melancholy. Softly, swelling to the strongest fortissimo and then decreasing to a moderate piano, giving way to pure triads and thus through the various voicings and turns of the harmony. At the beginning of the third crescendo and then immediately after, Zober observed in [the patient]

> a deep intake of breath and a strong shiver; that is, a complete seizure of the full nervous system. Yet she remained dumb and immobile. I preluded to G-flat major and began the chorale, swelling from the lightest breaths and back again and thus the first words were sung. We were not yet at the end, when clearly, supported softly by the choir, the tenor took the melody. Suddenly, the invalid cried loudly, "O! Antonio! Antonio!" (the name of the Spaniard) and began to cry so deeply that we had to stop our chorale; the young girl had to be carried to bed. Upon illuminating the room we observed the good news that upon crying "O! Antonio," at once her monthly flow had suddenly begun, as the floor was thoroughly soiled by it.
>
> (Schneider, 1835b, p. 267)

Schneider reports that Lina's health continued to improve, aided by additional sessions with the aeolodicon. He recommends that she be sent off to a country pastor to complete her recovery, while advising her parents to find her a suitable husband. His partially plagiarised and perhaps entirely fictional account ends with the news that Lina subsequently married one of her father's apprentices and gave birth to a boy.

The Medicine Behind the Therapies

Among the questions arising from these two case studies is whether Franklin and Schneider related the sounds of their musical instruments to a particular theory of medicine or whether they were relying on psychological suggestion, hoping to manipulate the passions or emotions and thus the human mind. In what follows, we examine these two possibilities based on what we know about Franklin and Schneider, contemporaneous beliefs about melancholia, and eighteenth- and early-nineteenth-century therapeutics.

Although some kinds of music have been consistently associated with certain emotions and behaviour since the time of Plato's *Republic*, if not earlier, interest in the acoustical and medical properties of novel instrumental timbres was largely an eighteenth-century development (Dolan, 2013). This change reflected a burgeoning interest in the design and classification of musical instruments, which were increasingly understood as conveying affect not only through the performance of specific repertoire, but also through timbre variables, including size, register and mechanism.

As musicologist Emily Dolan has shown, Franklin's armonica was the most successful of a number of contemporaneous attempts to translate the sustaining sweetness and nuances of vocal timbres into instrumental forms (Dolan, 2008, pp. 61–65). She contends that contemporary reports on the armonica typically ignored the repertoire performed in favour of a concentration on the instrument's sheer sonic quality (Dolan, 2008, p. 64). The idea that a mimetic representation of what Dolan terms "an ideal voice of nature" could be tamed and reproduced by musicians can be related to Mesmer's subsequent deployment of the instrument into his therapeutics (Dolan, 2008, p. 65).

Indeed, Franklin's use of both music and electric shocks to treat hysterical illnesses and other disorders might have reflected the eighteenth-century belief that certain sounds could act like electricity and other stimulants and cause material changes in the nerves.[5] That is, he might have opted for stimulating music because he accepted the belief that the right kinds of sounds could tighten flaccid nerves or enhance the flow of supposedly sluggish nerve juices. The ancient therapeutic practice of treating with opposites was still very much a part of eighteenth-century medical thought.

Colonial physician Thomas Cadwalader's thinking might have influenced Franklin to proceed along these lines. His book, *An Essay on the West-India Dry-Gripes* (a condition caused by lead poisoning), came off Franklin's press in 1745. It included a passage on the restorative properties of music:

> Every Stroke of a musical Instrument causes an Undulation of the Air, which giving some Concussion to the Fibres of the Body . . . produces a brisker Circulation of the Blood; and consequently invigorates the Nerves and lessens the Viscidity of the Fluids . . . it may, by acting on the Solids, be the means of regulating our Passions and bringing our Minds to a proper Degree of Calmness and Serenity.
>
> (Cadwalader, 1745, pp. 33, 34)

Franklin also corresponded with prominent London physician Richard Brocklesby and even owned a copy of his *Reflections on Antient* [sic] *and Modern Musick* (1749), a major treatise on music and theory of medicine (Gouk, 2015). There are several extant letters from Brocklesby to Franklin, though all date after 1772. Brocklesby's report of the musical cure of a melancholic Scotsman, who had been mourning the loss of his two sons in battle, might likewise have influenced Franklin's approach to music therapy:

> [The patient was] in so deep melancholy, that he refused the necessary support of food and all discourse with the persons usually conversant about him: when all other remedies were excluded, his physician (who previously knew what delight he formerly had in playing on the harp) propos'd to the patient's friends to engage one of the ablest hands on that instrument, to approach him with such soft and solemn sounds, as were formerly known to give him most delight . . . [and] by degrees the sick person was thereby induc'd to speak of ordinary things; and shortly after to take food and such medicines as were requisite in his condition, till at length he perfectly recover'd his former state of health.
>
> (Brocklesby, 1749, p. 35)

It should be noted, however, that Brocklesby links the Scotsman's cure to his previous enjoyment of the harp, rather than to intrinsic qualities of the instrument's sound.

By Schneider's day, the idea that certain instrumental timbres had privileged access to the nerves and emotions had become well established. Critics including Christian Friedrich Daniel Schubart, Carl Ludwig Junker and Peter Lichtenthal discussed various relationships between instruments and emotions, ranging from Schubart's expansion of the Baroque doctrine of *Affektenlehre* (Schubart, 1806) to Junker's correlation of the passions to specific instrumental combinations (Junker, 1792, p. 49) and Lichtenthal's detailed list of programmatic emotional applications for orchestral instruments (Lichtenthal, 1807, p. 190–196). In the domain of fiction, Hoffmann had memorably linked the sounds of novel instruments, such as the harmonichord, glass armonica and Aeolian harp, to altered emotional states (Dolan, 2008; Hoffmann, 1819).

Schneider drew explicitly on these thinkers in claiming that distinct sounds, instruments and keys had privileged access to the nerves. For example, he borrows Schubart's assignment of specific emotional effects to the various keys, according to which E-flat minor represents feelings of "blackest melancholy," while G-flat major represents "triumph over difficulty." (Schneider, 1835a, p. 284; Schubart, 1806, p. 378). These are the very keys that Schneider employed in his treatment of Lina, a modulation that enacted the emotional changes he hoped to stimulate in her psyche. These relationships, he claims, are at once mechanical, in that vibrations induce material changes in the state of the nerves and psychical, as certain sounds cause people to feel different emotions. Accordingly, "all musical emotions can be divided into the mechanical excitation of the musical tones, directed at the body and the psychic effects directed at the mind [*Geist*], which act upon the body through the mediation of the soul [*Geist*]" (Schneider, 1835a, p. 103; see also Korenjak in this *Companion*).[6]

Schneider theorises that music affects the body and soul according to the homeopathic principle of counter-irritation [*Gesetze des Antagonismus*] (Schneider, 1835a, p. 165). Feelings of exhaustion,

pain or depression should therefore be treated with music that gives rise to opposing sensations – quiet sounds to calm a manic patient and lively tunes to stimulate the melancholic.

The therapeutic use of opposites also has direct implications for timbre: Schneider claims that maladies of the spirit and soul (*Geistes und Seelenkrankheiten*) should be treated by a specific sonic palette comprised of an outmoded instrument combined with a newly-invented one. The former might include the viola d'amour, gamba and baryton, which Schneider regards as particularly suitable for "expressing moderate grief, gentle feelings, love's caresses and a peaceful happiness" (Schneider, 1835a, p. 219). As to new instruments, Schneider provides a long list of suitable options, comprising the

> Sistra, Czakan, Ophicleide, Sirenion, Hierochord, Melodicon, Clavycylinder, Physharmonica, Aeolodicon, Chordaudion orchestrion, Terpodion, Uranicon, Harmonichord, Octochord, Crescendo, Dittanaclavis, Euphon, Harmonicello, Panmelodicon, Xylosistrum, [and] Apollo-Lyra.
>
> (Schneider, 1835a, p. 220)[7]

He notes that these instruments do not require great technical skill on the part of the performer in order to produce therapeutic effects (Schneider, 1835a, p. 220). To summarise, Schneider's understanding of music therapy draws on a variety of medical theories: specific instruments induced sympathetic vibrations in the body, while also affecting the passions through ill-defined animal spirits (Smith, Frixione, Finger & Clower, 2012). Certain sounds were particularly suited to the treatment of overwrought emotions, most notably the gentle tones of old-fashioned instruments and the ethereal timbres of new inventions. Indeed, Schneider, if he is to be believed, put his musical theory into practice in curing Lina by means of a vocal quartet singing a chorale – representing older sound – combined with the novel tones of the aeolodicon.

Franklin and Schneider, however, might also have summoned their instruments with psychology in mind, in much the same way as a physician might prescribe a placebo to play on one's expectations. In this regard, they were neither first to attempt to cure melancholia and/or hysteria with music, nor to assume that unusual sounds might enhance the power of suggestion (Forman, 1984). Indeed, the eighteenth century was a time of growing interest in suggestion, both in medical circles and beyond. The new understanding of misunderstanding was largely due to John Locke's landmark *Essay Concerning Human Understanding* (1689), which outlined how easily people could be misled by assuming causes from correlations and observed effects. Franklin, who was closely familiar with Locke's essay, was succinct about the power of amulets, talismans and other placebos. "As charms are nonsense," he explained in his widely-read *Poor Richard's Almanack*, "Nonsense is a charm!" (Lemay, 2006, p. 210).[8]

Everything we know about Franklin shows he had an exceptional knowledge of rational and irrational human thinking and the power of suggestion. In this context, the armonica might have helped him achieve what he might have thought of as no more than what we would now call a placebo effect, supporting it with his reputation and by emphatically assuring his patient that she was now cured. In fact, it is entirely possible that he had applied the same reasoning years earlier when treating a hysterical young woman with electrical shocks – there too creating an ambiance that would have led her to *believe* that he could achieve the desired cure.

Franklin's fame in this domain soared in 1784, when he was appointed to head a commission to investigate Mesmer and his practices. Mesmer had been promoting controlled animal magnetism as a cure for all diseases. Although he never doubted that Mesmer's techniques could help some patients, Franklin and his associates were able to prove with sophisticated experiments that his and his assistant Deslon's reported cures were induced by suggestion, rather than the action of a guided but undetectable magnetic fluid (Franklin, Le Roy, D'Arcet, Guillotin & Lavoisier, 1785).

None of Franklin's extant letters mention Isabela Czartoryska or make any note whether he treated other patients in music-assisted therapy sessions. It is therefore entirely possible that what he did stemmed from multiple considerations. He would have been aware of the incorporation of music into current medical theorising by leading physicians. He also would have known that certain conditions could be treated psychologically, i.e., by suggestion. Moreover, he was pragmatic about his "medicine," focusing his attention mainly on what could be deemed safe and whether this failed or succeeded. In the latter domain, Franklin could have been basing his treatments with the armonica on the personal and widespread observation that certain types of music could lift spirits and on a second observation, notably that the sounds of his new instrument did not endanger his own health.

Like Franklin, Schneider was also aware of the power of suggestion, as his design of the musical cure makes clear. In his treatment of Lina, he describes crafting an ambiance reminiscent of Mesmer's intricately-staged séances by setting the performance in a darkened room, opting for the ethereal sounds of the aeolodicon, and passing himself off as a respected medical expert. Schneider tells us that the illusion worked: that Lina even believed (at least for a moment) that her beloved Antonio was speaking to her. Her tearful response brought about an emotional catharsis, enabling her to escape her melancholic apathy. Schneider added that this reaction was accompanied by the simultaneous return of her menses, which he linked to her return to health.

Schneider appears to have associated Lina's delayed menstruation with the wandering womb trope of hysteria. In a footnote, he muses: "One should almost believe that the soul had been nourishing itself from this blood, but was now returned to its old domain," immediately after which he asks: "Was this due to the *ethereal sounds*?" (Schneider, 1835b, p. 268). Explicit links between music and menstruation had been posited at least since the 1770s, and these would become increasingly prevalent by the middle of the nineteenth century (Kennaway, 2011, p. 33). According to Kennaway, beliefs about the particular sensitivity of female neuroanatomy and physiology were "central both to the refinement ascribed to ladies in the Cult of Sensibility and to the pathology, hysteria and enervation that critics associated with it" (Kennaway, 2012, p. 41). Although Schneider does not address the subject again in his *System*, his references to the special influence of ethereal sounds on the female body intersected with contemporary discourses on sensibility and pathology.

Common Features

The case studies of Isabela and Lina intersect in a number of intriguing ways. As might be ascertained from their various writings, both Franklin and Schneider were interested in music and particularly new instruments. Franklin was a capable performer on the viola da gamba, harp, harpsichord and, of course, his armonica, whereas Schneider was proficient on the pianoforte, violin, clarinet, flute, as well as the aeolodicon. Both the armonica and the aeolodicon were newly invented at the time and they produced novel sounds that were understood as otherworldly and ethereal within popular culture. Indeed, the armonica would later be employed in phantasmagorias, late-eighteenth- and early-nineteenth-century horror shows (Castle, 1988). The sounds of harmoniums were also associated with heightened mental states in the literature of the Romantic Period (Raz, 2014). For example, in Honoré de Balzac's vignette, *Le Dôme des Invalides* (1832), the timbre of a harmonium induces hallucinations by "playing on the nerves," while in Thomas Hood's short story, *Hayder's Emerald Cup* (1843), it amplifies a hashish-induced delirium (Balzac, 1832; Hood, 1843).

In both cases, the musical cure targeted young women suffering from melancholia. The fact that both subjects were female is unsurprising, since hysterical complaints (which encompassed melancholy) were thought to be predominantly female disorders at the time – especially affecting society ladies of marrying age, whose nerves were supposedly finer and more susceptible to

derangement (Beiser, 1994, pp. 5, 6). Moreover, as recent scholarship has shown, the musical glasses, along with domestic keyboard instruments, were regarded as paradigmatically "female" instruments early in the Romantic Era (Hadlock, 2000; Head, 1999).

Another common feature of these cases lies in the fact that neither Franklin nor Schneider possessed a medical degree. Franklin, who received an honorary doctorate in law from St. Andrews University in 1759 acquired his education by reading newspapers, pamphlets and books, and by interacting with learned people, mainly physicians, at home and abroad (Finger, 2006). Although Schneider earned a doctorate in philosophy 1831, he also seems to have attained much of his knowledge of medicine on his own, claiming to have devoted "all of the hours that others spend on the pleasures of the hunt, cards or social diversions, to medicine" (Schneider, 1835b, p. 371). Yet unlike Franklin, who was applauded by his contemporaries for his therapeutic innovations, Schneider had a contentious relationship with the medical community, coloured by accusations of charlatanism some of which, as we have seen, were deserved.[9]

Both Franklin and Schneider were also profoundly interested in novel treatments of mental illness. With Franklin, this is evident from his earlier collaboration with Cadwallader Evans, in which they used therapeutic electricity to treat hysteria. Later that year, when Franklin attended his first meeting of the Royal Society of London, he learned about a hysterical Scottish woman, who also had been treated successfully with mild electricity (Whytt, 1765). Schneider also seemed to have been aware of psychogenic symptoms, as shown in some of his reports on stutterers in his book on speech disorders, *Fragmente aus dem Tagebuche* (Schneider, 1835c).

Although hysteria, melancholia and related disorders were widely attributed to psychological factors altering the physical machinery of the body during the eighteenth century, by the 1830s the same disorders had become increasingly regarded as mental alone – and were now being treated accordingly. The medical revolution associated with French psychiatric reformer Phillippe Pinel was well underway, prompting a greater awareness of psychic factors in cases of physically healthy patients presenting symptoms that might only resemble paralyses, epilepsy and the like (Goldstein, 1987).

Conclusions

The advent of the modern concept of instrumental timbre and the rise of modern psychiatry, both of which can be traced to the last few decades of the eighteenth century, might at first appear unrelated. Yet both share at their core the desire to understand, catalogue and control affective and irrational dimensions of human experience. Early-nineteenth-century approaches to treating mental illness often relied on the power of suggestion to induce emotional changes and bring about altered affective states. Franklin's earlier use of suggestion in treating Isabela Czartoryska appears to have been based on an understanding of psychology similar to that of Pinel and his school, who advanced the "moral method" of treating the insane. Pinel famously claimed that the only way to cure patients suffering from delusions of demonic possession was through "strong antispasmodics, the charms of music or the excitement of profound emotions . . . the means which priests of all ages have adopted with equal avidity and address" (Pinel, 1806, p. 238).

Pinel's student and successor, French psychiatrist Étienne Esquirol (1772–1840), conducted extensive experiments on music therapy at the Salpêtrière, the large Parisian asylum for women where Pinel had instituted some of his reforms. During 1824 and 1825, Esquirol examined the effects of music on 80 female subjects, selected from "the convalescents, the maniacs, the tranquil monomaniacs and some lypemaniacs" at the asylum. With performances by distinguished music professors from the Paris Conservatoire, Esquirol studied the effects of listening to the harp, piano, violin, wind instruments and voices, as well as the genre, meter, key, composer and length of the pieces. He relates:

> My patients were very attentive, their countenances became animated, the eyes of many beamed with additional brilliancy, but all remained tranquil. Some tears were shed . . . . A great number of the women became excited, exalted at the sound of the instruments and many, among the furious, formed circles in order to dance . . . . This novel spectacle was not without influence upon our unhappy patients, but we obtained no cure, not even an amelioration of their mental condition.
>
> (Esquirol, quoted in Earle, 1841, pp. 140, 141)

Esquirol focused on the psychological effects that music could have on his patients and ultimately concluded that music's direct effects on the emotions, whether by suggestion or distraction, constituted a valuable means for soothing certain kinds of patients.

Esquirol's examination of a myriad of musical parameters on his patients also reflects a new attitude toward sound and timbre, evident not only in orchestral practice, but also in the emergence of instrumentation manuals during the late-eighteenth century. These were subsequently followed by complex orchestration treatises, most notably Hector Berlioz's *Grand Traité d'Instrumentation et d'Orchestration Modernes* (1843). Berlioz's treatise included elaborate instructions for the application of instrumental effects within symphonic textures, as well as a detailed description of the emotional and physical effect of these sounds upon the audiences. For example, he recommended muting a clarinet by placing its bell in a leather bag. Accompanied by strings and a harp, the ensuing "ghostly music produces an effect of desolation and brings tears to the eyes as no other expression of sorrow could do; it wrings the heart as much even as the trembling harmonies of the Aeolian harp itself" (Berlioz, 2002, p. 127).

Unlike eighteenth-century theories of *Affektenlehre*, which interpreted specific passions through a corresponding mimetic representation related to interval size or tempo, this Romantic focus on instrumental timbre often appeared to circumvent the rational realm altogether, relying on the ability of unusual sounds to induce physical and emotional responses by suggestion. Composers and listeners alike hungered for novel sonic combinations that could induce sublime experiences; hence, innovations including the massive expansion of the symphony orchestra (and the role of the conductor), the invention of the accordion, harmonium and saxophone and new spatial configurations, such as the covered orchestra pit (Brittan, 2015; Dolan, 2013; Kane, 2014). Schneider's treatise, with its recommendations on the emotional effects of instruments, orchestral combinations and specific sounds, often reads more like a guide for a composer than a physician.

Franklin's treatment of Isabela Czartoryska and Schneider's reported cure of Lina, both involving new musical instruments with novel, ethereal sounds, have received little attention from medical or music historians. The employment of the armonica and the aeolodicon in therapeutic settings reflect the prevailing belief that certain timbres might be particularly suitable for altering the emotional states of listeners through material changes in the nerves or by acting directly on the mind. Products of the contemporaneous interest in the influence of novel sounds on the emotions, these instruments reflect avenues for therapeutic experiences that might not have been possible a mere half century earlier. The features of these two case studies demonstrate the means by which new cultural understandings of timbre were transformed into music-assisted therapies during what music historians refer to as the Classical and Romantic Eras.

Notes

1 François-Joseph Fétis confuses the two figures in the 1840 edition of the *Biographie Universelle des Musiciens et Bibliographie Générale* (Fétis, 1840, p. 126).

2 Reports of Schneider's public demonstrations can be found in the following newspapers: *Regensburger Zeitung* 307 (December 26, 1835): p. 4; *Der aufrichtige und wohlerfahrene Schweizer-Bote* 103 (December 26, 1835), p. 412; *Bayerische Landbötin* 18 (February 11, 1836), p. 157.

3 As George Dodd would subsequently note, "Aeolophon, Aeolodicon, Aeolharmonica, Melodium, Melodion, Aeolomusicon; what liquid sweetness of names!" (Dodd, 1853, p. 402).
4 All German translations by the first author.
5 Historian James Kennaway writes that by the end of the eighteenth century, music and electricity were increasingly regarded as "two forms of the same essence" of a "sexualised electrical life force" (Kennaway, 2011, p. 198). It is also worth emphasising that Franklin's treatment of Isabela Czartoryska by glass armonica predates Mesmer's use of the instrument, through which it acquired various pathological associations that would later be developed by Anthony Florian Willich and others (Hadlock, 2000).
6 While Schneider uses the word "Geist" twice in this passage, we have chosen to translate these two instances as mind and soul, respectively.
7 The inclusion of the ophicleide (a kind of tuba) and the crescendo (a dynamic marking) suggests that Schneider might have been poking fun at the elaborate names of these fashionable new instruments.
8 Poor Richard refers to Richard Saunders, Franklin's henpecked creation, a struggling philosopher.
9 While *System* was not reviewed in medical journals, Schneider's subsequent book on speech disorders, *Fragmente aus dem Tagebuche*, was viciously attacked in a number of publications. A reviewer for the *Jahrbücher der in- und ausländischen gesammten Medicin* (1836) castigated Schneider's use of the title "Dr.," as well as the inclusion of unverified patient testimonies (Schmalz, 1836, pp. 234–237). The *Encyclographie des Sciences Médicales* mocked Schneider's lack of medical qualifications as well his inclusion of advertisements promoting his alleged cures (C., 1836, p. 179). In 1837, the Württemberg Medical Association published a letter accusing Schneider of plagiarising Marc Colombat de l'Isère's treatise on vocal maladies (Ruef, 1837, p. 208).

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FRAMING EMOTIONAL RESPONSES TO MUSIC

Music-making and Social Well-being in Early Nineteenth-Century England

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The idea that "singing is good for body and soul" is a truism that has been wheeled out periodically over the last 50 years at least. In popular media one of its recent and strikingly successful manifestations has come in the form of BBC2's reality TV show "The Choir." Setting out initially to revitalise and popularise choral singing, British choirmaster Gareth Malone's show soon tapped into recent scientific interest in the health potential of engagement with music, culminating in his efforts to bring ex-military personnel with a variety of health conditions together to sing for the opening night of the Invictus Games. The show presented a heady mix of rehearsal pressure and performance anxiety in the run-up to an international live broadcast, yet its narrative rhetoric – spun through the presentation of the participants' personal battles to overcome PTSD as well as life-changing injuries – affirmed in the viewer the strong belief that the act of singing was proving beneficial for the volunteers.[1]

While the idea of health through singing has long been embedded in the public imagination, the effects of singing on body and mind have only recently been the subject of longitudinal scientific investigation. This chapter starts with a brief review of recent research into music, emotions and well-being to illustrate two trends. First, research has traditionally centred around listening without distinguishing this from physically active engagements with music. A potential advantage of the focus on listening resided in the direct relationship between music and individual listener, at least if one leaves aside the muddying impact of the effects of collectivity, which may be measured through interviews and through validated psychological scales, yet which so far have not been tied definitively to biomarkers (for recent scientific research that seeks to rectify this, see Fancourt in this *Companion*). Second, within studies focusing on music-making rather than listening, any differentiation between group music-making and an individual's singing and playing is still rare. Researchers have not been blind to this issue and have acknowledged that the causes leading to any potential benefits of choral singing could include factors such as the sense of community that resides in the idea of "one voice," the ritual of rehearsal and performance, the sense of history, tradition and heritage, the sound of a mass of gathered voices per se and the feeling of achievement and success that arises from adrenaline-fuelled performances. While recognising these influences, accounting for them and evaluating their long-term effects has been more difficult.

The core of this chapter will show that precisely these two factors – a separate formulation of the meaning of music when perceived through listening and through physically involved music-making and the relevance of the community of singers in choral situations – were at the heart of the formation of a widespread British choral culture in the late eighteenth and early nineteenth centuries. At this time, engagement with music was increasingly formulated along two separate avenues: listening to music was promoted as a form of metaphysical enlightenment that would improve the individual through the perception of the universal truths of high art works; on the other hand, choral singing and choral societies promoted active engagement with a musical repertoire that was predominantly sacred, thereby moving spirituality into a secular space. As we will see, ideologies of social belonging, education and moral self-improvement catalysed the choral movement. Crucially for our purposes, from the start these ideologies were suffused with quasi-medical theories of the interaction of body and mind, of the self and of health and well-being.

In the final section, I want to raise the question to what extent an awareness of a historical-cultural framing of a particular activity – choral singing – can help shape scientific investigations by influencing the questions we ask and the manner in which we approach studies. This springs from an acknowledgement that many of the studies conducted are involuntarily set within the inescapable cultural context of a British tradition of choral singing, since the latter, especially in the form of choral societies, has remained an entrenched part of British middle-class life since the early nineteenth century.

Is Singing Beneficial for Body and Mind?

In her recent essay collection *Chorus and Community*, Karen Ahlquist introduces choral singing as "an activity seemingly as natural as breathing and as easily taken for granted" (Ahlquist, 2006). Throughout Western history singing has been framed as a pre-verbal form of communication, a narrative that is regularly evoked in current studies on the role of singing in relation to well-being (Nettl, 2000; Perkins, Ascenso, Atkins, Fancourt & Williamon, 2016; Tomlinson, 2015). Both musicologists and anthropologists have paid heed to sound itself, to utterance and to its meaning as a "voice." In late Enlightenment theories, the debate around sound, utterance and music was often concerned with individual voice versus collective voice, with an expression of self and an establishment of the identity of self in relation to others. This ideology of the individual still runs through today's thinking on well-being. The chapters in Ahlquist's collection document the plethora of choral singing activities that take place daily within a vast variety of social, religious and ethnic groups. While they portray a wealth of objectives attached to the participation in or support of, these activities, they share the same core: the desire to form a community and to experience strength in the unified voice that results from the doubling of voice parts. All chapters highlight "community" as "a group of people that gathers for a reason: whether to remember and recall, to share or to create new experiences" by investigating the interaction of individuals in and through choir practices so as to represent a community or belief, to instate it or to maintain it (Barz, 2006, p. 25). What's more, the chapters suggest that individuals can take on a number of different identities through engagement in different groups, adding to their sense of empowerment. This process of "organisational self-creation" emerges as the second central tenet of the historical, ethnomusicological and sociological chapters in Ahlquist's collection (Ahlquist, 2006, p. 6). Strikingly, the concept maps neatly onto recent musicological investigations into the origins of choral singing across Europe, despite the fact that the latter deal largely with the institutionalisation of choral singing and therefore address the model of self-creation as a means to an end. In that context, singing is read as a means toward an external goal, used to perpetuate a musical canon and establish a cultural status; to universalise and colonise through culture; to attain or portray social status; to display and affirm

political or religious values; and to preserve an ethnic heritage (Applegate & Potter, 2002; Drummond, 2011; Minor, 2012; Pritchard, 1968, Weber, 2003).

Psychological, psychophysiological and psychoneuroimmunological studies conducted in the last 20 years, on the other hand, have focused internally to investigate the effects of choir singing on the individual, potentially with a view to instituting choir singing in health settings. Building on research into the effects of music listening, subjective emotional experience and immune competence, recent studies have compared both physiological responses and subjective mood as affected by the two different acts of listening and singing (listening: Goldstein, 1980; Kreutz, Bongard & von Jussis, 2002; Osuch et al., 2009; see Eerola, Taruffi & Koelsch, and Heggli, Kringelbach & Vuust in this *Companion*; singing: Beck, Cesario, Yousefi & Enamoto, 2000; Kreutz, Bongard, Rohrmann, Hodapp & Grebe, 2004; Ilari, Henley, Hallam and Hara & DeNora in this *Companion*). Using a combination of *Interpretive Phenomenological Analysis*, psychometric scaling (PANAS) and saliva samples to measure S-IgA and cortisol levels, they indicate that the effects of singing and listening were significantly different and that singing studies showed a greater consistency between psychological and physiological findings. Furthermore, they suggest that choir singing influenced both immune functions as well as positive emotions, while listening had a positive impact on negative mood and cortisol and in that sense had a calming effect, although it did not have the same positive influence on mood or on immune functions that singing had (Kreutz et al., 2004). Further studies have been conducted to examine how singing as an activity compares to other activities such as reading, attending cultural events and swimming (Bygren, Konlaan & Johansson, 1996; Valentine & Evans, 2001); some studies have compared the impact of different activities on particular physical or mental health conditions (Dingle, Brander, Ballantyne & Baker, 2013; Grape, Wikström, Ekman, Hasson & Theorell, 2010). Further studies have focused on the changes in biomarkers and health regardless of communicated emotion while still paying attention to synchronisation between individuals (Müller & Lindenberger, 2011); others still have examined the differences between individual singing and choir singing (Grape et al., 2003; Valentine & Evans, 2001). While the methods used to determine the effects of all these different variables – individual versus collective music-making, the nature of the activity itself in comparison with other physical and mental activities, physiological responses versus individual perception – have varied considerably, the results nevertheless display pronounced commonalities in the "perceived effects": the sense of empowerment through learning something new and, crucially, the sense of empowerment derived from the group situation, the collaboration and the sensation of forming a collective voice (Bailey & Davidson, 2005; Clift & Hancox, 2001; Clift et al., 2010; Tonneijck, Kinébanian & Josephsson, 2008). As a result, the latter has been identified as a field for further investigation (Di Grazia, 2013; Haslam, Jetten, Postmes & Haslam, 2009).

Before investigating the origins of large-scale amateur choral singing in Britain, I want to point out some parallels and differences between the different approaches to singing and well-being. The first link between investigations into choral singing across the disciplines of musicology, sociology and health sciences is the fact that all of them account for emotions as a central aspect in the meaning of singing; across the disciplines, emotions are read as the outward expression of the sense of self and it is taken as a given that music inspires emotions to a greater or lesser extent. What differs, though, across the different fields is that the historical literature reads emotions as drivers toward establishing, affirming and communicating values that lie outside of the act of singing, while scientific studies have taken the opposite approach by asking: how does an external activity inspire emotions that are psychologically and physiologically measurable? Second, scientific studies have shown that the perceived well-being benefits result from the sense of community achieved through choral singing, while historical studies have focused on this community per se. Finally, scientific studies have shown that listening has different effects to singing, a factor that both historical and scientific studies have ignored until relatively recently.

In the following, I focus on two historical facts that make these parallels particularly interesting: communal singing, i.e. the way in which we define choral singing today with many voices coming together to sing the same part, was not practised according to written Western musical culture until it emerged in the eighteenth century and was established as a community practice in the early nineteenth, except in one specific context: in churches. That is not to say that it did not happen, but as a community practice for non-professional musicians it is not systematically recorded. Second, it became part of recorded mainstream culture at precisely the time when listening and making music were framed as significantly different acts in music aesthetics, a development that also coincided with a medical reformulation of the relationship between listening and the emotions.

Listening to Music in Early Nineteenth-Century Britain

"The want of encouragement, which has for many years past been experienced by that species of music which called forth the efforts and displayed the genius of the greatest masters and the almost utter neglect into which instrumental pieces in general have fallen, have long been sources of regret to the real amateur and to the well-educated professor." Thus explained the founding fathers of the Philharmonic Society – the Royal Philharmonic Society since 1912 – the purpose of their endeavours in 1813 on the eve of the society's establishment (Elkin, 1947, p. 11). This short snippet extracted from its founding statutes betrays multiple layers within the founding ideology that were infused with anxiety about social status. While the implicit critique of Italian opera (as opposed to instrumental music) has been much discussed in musicology, other aspects relating to the social stratification implied by the support for or rejection of Italian opera in early nineteenth-century London (where the upper classes still held on firmly to their prestigious opera boxes) have received less attention (Taylor, 2010; Weber, 2008). The "real amateur" addressed here, for instance, was someone who had received a sufficient musical education during his leisure time and could appreciate the details of a musical composition; the well-educated professor was his professional musical counterpart who shared an appreciation of high art even though he belonged to a different social class. United they stood in the great "efforts" that a certain type of music demanded. The latter, in fact, formed the ideological heart of the Philharmonic Society and its formation: it was seen to demand "exertion," "nourishment," and "support," a rhetoric that promoted a new listener behaviour epitomised by a silent yet attentive engagement with the music (Elkin, 1947). The music was received purely through the act of listening. The concert hall became a silent space filled with reverence.

The relationship between listening, knowledge and emotion had become a particular matter of interest in the second half of the eighteenth century. Johann Georg Sulzer captured German-speaking aestheticians' interest in the sense of hearing and the act of listening in his *Allgemeine Theorie der schönen Künste* (*General Theory of the Fine Arts*), first compiled in the 1770s, then expanded in the 1780s and 1790s (Sulzer, 1792). The multi-volume work documents the ongoing substantial negotiations around art and its role in the education of the individual and society that characterised the late Enlightenment (Outram, 2013; Smith, 2007; Sorabji, 2006; Wahrmann, 2004). Its articles on musical subjects reveal a great interest in the composition of music and in the proper reception through listening. Here two types of listening were discussed (Bonds, 2009; Riley, 2004). The first was referred to as "natural," which in Sulzer's terms described an immediate perception, unmediated by thought, usually resulting in or mixed with astonishment. This type of natural listening – or hearing – was associated with dance music in particular which in the emerging taxonomy of (secular) music that his encyclopedia was composed to erect and affirm was classed as a lower form of musical art. In this music and its associated listening, a physiological reaction to ordered sounds was central. The article on music in the encyclopedia asserted that music generally has a "truly physiological power, which stimulates those nerves that are responsible for movement" (Sulzer, 1792, § Musik, III, 424). Even though Sulzer acknowledged that, in order to do this, dance music

had to adhere to certain rules that would create a spirit in the music itself, he conceded that this rational creation – the knowledge of how to combine meter, melody and rhythm – did not need to be met with a rational understanding on the part of the listener in order to inspire a powerful, visceral effect. This music, thus, remained functional: it was to be used to inspire certain types of emotions in the listener that were compulsive and unmediated, and that could therefore be used to enhance particular emotive situations such as a ball, a ceremonial procession or a military march (Sulzer, 1792, § Instrumentalmusik, II, 677; compare Brauer as well as Kennaway in this *Companion* for later instantiations of these ideas).

The second type of listening was attentive, reflective and revelatory. In its early formulations, this type of listening was aimed at an intellectual engagement with the music that centred either around building up and then defying conventions or around the music's complexity itself (as in fugal music); both would stretch the listener's imagination, forcing him or her into intense concentration. Music that achieved this was deemed the highest art of music and it was elevated above the functional music described above. A very specific art of listening, then, became the necessary tool to tame music's seemingly visceral effects and to bend these so as to serve art's proper role in society: the moral education of men and women. "One would see it in no other art, that it seizes the soul so quickly and so irresistibly," the article on music reads, yet the movements of the soul had to be coupled with reason so as to turn into an emotion proper, i.e., a morally powerful emotion (Sulzer, 1792, § Musik, III, 432). Music that engaged reason in tandem with sensation was deemed morally uplifting, whereas music that tickled only the senses – dance music and later virtuosic music – was worthless, even detrimental to the individual's moral development.

These theories shifted the focus of music's effects from the body to the mind but theorists nevertheless held on to the fundamental idea that music was intricately wedded to the sensations and emotions. What shifted was merely the question whether music alone could induce particular emotions in the listener and how music aided the acquisition of knowledge by mimicking or expressing these. Shifting the act of listening centre stage implied a shift away from the idea that music itself contained parameters that chimed with the human body and mind in ways that created emotions, to the idea that the combination of the listener's mind with the music would create meaning. Turning a sequence of sounds into meaning became the responsibility of the individual through the sense of listening.

On the cusp of the nineteenth century, the mechanics of this responsibility were still framed in different ways with recourse to either material or mental operations in theories that considered the significance of the act of listening in two different ways. The materialist view was concerned with the sense perception and the resulting emotion, while theories on mental operations narrowed the purpose of music down to an aesthetic experience. Renowned German anatomist Samuel Thomas Sömmerring suggested that he had located a place in the human brain, in close proximity to the inner ear, from which perception and emotion were regulated and where they would thus morph into each other (Sömmerring, 1796). In medico-philosophical terms, he picked up on the belief in a physiological presence of a *sensorium commune* as a central point for the merging of the senses as it had still been prevalent in the seventeenth century (Hagner, 1992; Irvine, 2013; Summers, 1987). In contrast to those earlier theories, he located the *sensorium commune* in the brain, but retained its materialist conception. He thereby differed significantly from Kant who argued against Sömmerring's materiality in suggesting that a *sensus communis* must be independent of any physical and with that perceptual individuality (Kant, 1798). Instead, it was an *a priori* human capacity that allowed collective agreement on matters of morality, taste and feeling. Crucially, this *sensus communis* required honing through a continuous mediation of the necessarily biased individual sense perception with reason, i.e., with formal parameters that could be agreed and shared by all (Kant, 1790). Music's seemingly unmediated impact on the body, therefore, was a nuisance and one that rendered music less useful than the other arts in the training of the Kantian *sensus communis*.

Despite the deep rift between Kant's and Sömmerring's thinking, they both agreed that music in the first instance had a profound physiological effect on the individual and that this effect was always coupled with emotion. In fact, Kant in his *Critique* conceded that music might be beneficial for health: returning to physiological models, he explained that music affects the emotions, which in turn send waves through the organs; this enhances a physical equilibrium and affects health positively (Kant, 1790). Yet, he was critical of the role of the senses and of the emotions in the establishment of universal values that could be commonly recognised, acknowledged and communicated. Nevertheless, Kant followed Sömmerring in his section on hearing, "Vom Gehör," in his *Anthropologie in pragmatischer Hinsicht* (*Anthropology from a Pragmatic Point of View*) (1798), when he classed hearing together with sight and touch as vital senses (*sensus vagus*) that affected the full nervous system and not just one organ as did the senses of smell and taste (*sensus fixus*). In this essay, he credited the sense of listening with enabling culture and communication, and he acknowledged that music's potentially strengthening effects on the vital senses aided the feeling of agreement and communality. Here, the particular sensation of a willingness toward communality was formulated as a key piece in the possibility of a sociability that was required to form the core of social life.

In German-speaking countries, Kant's theories would transform into a powerful pronouncement of the metaphysical truth of art in the work of German idealists of the early nineteenth century such as Tieck, Hoffmann, Fichte and Hegel. Central to this metaphysics of music was its reception in silent reverence. Emotions inspired by music were aesthetic and therefore disinterested. Communality was sublimated into the union that was formed on the basis of the intrinsic understanding of this metaphysical truth, independent of its communication to each other (Bonds, 2009; Neubauer, 1988; Steinberg, 2006). This lay at the heart of the ideology of silent listening which the Philharmonic Society promoted in London in 1813 as they sought to bind listeners together in silent understanding of great art, sidelining ideas of community rooted in communication for those rooted in a particular belief. Unity was established among the initiated and was celebrated in silence. This belief was outwardly entrenched in the professionalisation of the orchestra manifest in the setting up of orchestras as economic entities, in the accompanying solidification of class boundaries between the professional musicians and the orchestras' aristocratic and gentrified subscribers and in the spatial separation of the orchestra on stage and the listeners in the auditorium that would become the norm for orchestral concert culture in the nineteenth century (Johnson, 1995; Sachs, 1990; Weber, 1992, 2003).

Making Music – Having a Voice

Medical and philosophical formulations of the significance of listening sent ripples across musical communities on both sides of the Channel, bringing along with them the concomitant reformulation of the experience of music as an aesthetic revelation. Yet, in Britain the subsequent rise of the universal art of instrumental, mostly symphonic music, was rivalled by another, equally prominent development: the rise of choral societies across the country, made visible through their large-scale annual choral festivals. Here, the purpose of music was formulated not as a pure aesthetic experience but as a collective, spiritual one. Crucially, choral singing was established on an ideology of physical engagement that retained (in the practical arena) the materialist idea of a common sense, at least insofar as it was powerfully present in the collectivity of the choral practice.

The origins of the British choir phenomenon have been traced at least as far back as the early eighteenth century, when the Three Choirs Festival was first established in 1713 and its ideological roots have been linked to the phenomenal success and influence of the Handel Commemorations in Westminster Abbey in 1784 (Drummond, 2011; Pritchard, 1968; Boden, 1992). These early festivals, however, were not the same as the choral societies and festivals that sprang up across Britain after 1784. While the early festivals were carried out predominantly by professional singers, the significant new development of the early nineteenth century was the large-scale amateur involvement

in public, communal singing. Provincial choral societies grew out of a strong desire for communal music-making that grew rapidly in the second half of the eighteenth century. While this has been partially addressed in more recent publications that acknowledge and investigate the centrality and meaning of regular rehearsals as opposed to performances (Applegate, 2013), here I want to investigate the reasons that lay behind the desire for regular communal musical practices instituted in these societies.

The rise of communal amateur singing was rooted in a complex interaction of the formulation of identity and individuality in philosophical treatises, the growing audience for the dissemination of such thinking through printed media, the increasing interest in matters of education and the simultaneous restriction of congregational singing in the Anglican church. Since the beginning of the eighteenth century, large-scale professional church music had been in vogue at the Chapel Royal; cathedral music practice followed suit. The practice was deemed to enhance the expression of piety while silencing the rabble by abolishing the old practice of metrical psalm singing; it was also seen as an appropriate way to display a newly prosperous society (Temperley, 1983). Worship was wedded to *decorum* which was formulated in opposition to "extremes, enthusiasm and spontaneity" (Davies, 1961/1975, III, pp. 74, 75). Increasingly, reverence was tied to temperate engagement in music that would involve a silent listening rather than a noisy, enthusiastic and physically involved singing. This physical distancing for the sake of a mental and spiritual experience became increasingly important to members of an aspiring class who would show off their new-found wealth by financing parish church organs or endowing a Christian school for the poor whose pupils would be trained in singing. The aspiring class would, in other words, pay to have God's praise sung rather than praise directly (Temperley, 1983). The organ became the sounding and the metaphorical representation of the higher art of worship through silent listening: descriptions of its imposing physicality and its acoustical design were increasingly couched in the language of emotions.

Opposition to this development came not least in the rise of Methodism (Clarke, 2009; Temperley & Banfield, 2010). John Wesley thought that the professionalisation of music got in the way of religious feeling, and by reviving congregational hymn singing he sought to infuse religious practice with enthusiasm. Spirituality had to be practised through active engagement in rituals that could inspire strong and spontaneous emotions; worship was thus to be conducted physically as well as mentally by each individual. Whereas silent listening for him created merely the recollection of an experience, he promoted the experience in the moment of singing. In his formulation of religious enthusiasm, the psychosomatic experience of active involvement in worship was perhaps more significant than mental and rational processes. This call for the materialist aesthetic of active engagement in singing was taken up by others as well. Charles Avison, for instance organist since 1736 at St Nicholas, Newcastle-upon-Tyne, juxtaposed an ephemeral "species of delirium" that he saw attributed to the reception of Handel's music professionally performed to a listening audience with the "rational, benevolent and happy tranquillity" brought by actively joining in the singing of melodies and simple harmonies that he had promoted in his renowned *Essay on Musical Expression* (1752). He, like Wesley, promoted the active making of music over listening.

Choral societies provided a new forum for the cultivation of music through active engagement rather than listening at precisely the time when congregational singing was discouraged in church and secular music was moving onto a more formalised, public professional stage. Even exclusive, private singing clubs such as the *Glee Club*, the *Madrigal Society* and the *Anacreontic Society* – formed of male members of the upper classes and popular since mid-century for the purpose of convivial singing – changed from amateur, sociable singing circles into concert series during the last quarter of the century (Doane, 1794; McVeigh, 1993; Sachs, 1990). Women, on the other hand, suffered less from the professionalisation of music than from their silencing in church. Choral societies, then, brought together men and women in the act of singing and attracted members of a social class that was barely represented in the urban gentleman's societies. They adopted a spiritual hue by singing

sacred repertoire that was nonetheless not denominationally specific. Finally, they tapped into associational powers of music that both Wesley and Avison had celebrated: Wesley had adapted popular tunes (often from operas) to sacred text so as to combine the associational powers of the tune with the moral instruction of the text and turn singing's physical stimulation into a powerful concoction of religious sentiments. Avison, similarly, had praised the singing of familiar tunes to internalise their "essential property" and thereby "pour in upon the mind a silent and serene joy" (Avison, 1752).

Active engagement in singing also infiltrated the popular medical discourse. Here, singing was praised as a beneficial exercise that would aid physical well-being. Besides more serious medical treatises dealing with the favourable effects of music such as Richard Brocklesby's 1749 *Reflections on Antient and Modern Musick, with the Application to the Cure of Diseases* (Gouk, 2014), pamphlets such as the eccentric James Graham's *Guardian of Health* of 1790 suggested that ladies in particular should engage in the act of singing loudly when in private as a form of mild exercise for the body. Exercise was considered most beneficial if it involved the entire body in a mild regime of movement. Singing exercised the core muscles in the torso and created different levels of pressure on the lungs. This view of singing had already been articulated by Richard Browne early in the century in his *Medicina Musica* (1729), in which he outlined that the benefits of singing lie in the pressure that the lungs filled with air exercise on the lower abdomen, thereby stimulating the nerves in favourable ways. Both treatises are testimonies to the eighteenth-century concern with the nervous system as the centre for human health. Music's powers over the passions developed into a topic of medical interest because its effect on both soul and body located music's power conveniently on those borders that were being re-negotiated in medical discourse (Gouk, 2014; Kennaway, 2012). Music here served as a prop to articulate the relationship between nervous system and mental health. As such, it was also prominently articulated in courtesy literature designed particularly for the female reader. This particular body of works constructed a femininity based on the temperance of the emotions; the literature – infused with references to health and well-being – promoted music-making as an "activity" related to and similar in manner to dancing, which was seen as mild physical activity. It is significant for the development of music-making in late eighteenth-century Britain, then, that nervous over-stimulation was not considered an effect purely of music's impression on the mind via the ear; rather, music was commonly discussed as an actual bodily practice with a focus on the process of music-making rather than the process of musical listening.

The emerging choral activities of the early nineteenth-century were united by factors that answered to these ideas. First, choral singing was promoted among amateurs with little musical training. Choral societies relied on the communal training of voices rather than the promotion of singing lessons for each individual at home (McGuire, 2009). The Sacred Harmonic Society for instance, founded in London in 1832 and known today for its large-scale performances of oratorios at the Crystal Palace, had at the core of its founding ideology the stability of weekly rehearsals. Performances were an additional extra, not the society's central objective in its initial stages. Second, the typical repertoire for choral singing was sacred, normally comprising the choruses from Handel's oratorios supplemented with hymns and occasionally anthems. In performance, Handel's oratorios were performed either whole or entire parts of its were sung in order but the virtuosic arias were taken by professional singers invited to join for the occasion (Drummond, 2011; McGuire, online database). As such the stimulation was prised apart into its two components: whereas singing the simpler tunes and harmonies of the choruses stimulated the body through a moderate engagement, listening to the more virtuosic music was reserved for the singular and therefore less potent stimulation of the single sense of hearing.

Similarly, the powers of the listening experience that had been communicated with reference to the late eighteenth-century performances of Handel's oratorios were mediated through the rationality that was involved in studying some of its music. The combination of different modes of engagement

therefore mediated against potential over-stimulation through music. Interestingly, vocal treatises written during the early nineteenth century such as Gesualdo Lanza's *Elements of Singing* (1818) and Richard Mackenzie Bacon's *Elements of Vocal Science* (1824) tied the expressive qualities of music to the physical movements of the singer with the assumption that the singer had to both feel and mechanically reproduce the correct emotion so as to express it.

Third, the repertoire sung by choral societies was sacred yet non-denominational, reflecting the fact that these societies flourished at a time when many of their potential members had become disillusioned with the Anglican established church and had turned to dissenting communities instead. In choral societies, members of dissenting and established congregations could come together to exercise a spirituality in a secular sphere, partaking in the moral value of the sacred repertoire as well as the sense of community created by joining voices. It was not surprising that the aims of the societies' performances were articulated through the act of charity with proceeds going to the needy. Here, the essence of the eighteenth-century idea of a *sensus communis* reared its head in the belief that the human sense – or capacity in the Kantian sense – for pleasure and beauty, truth and benevolence were intricately related. This *sensus communis* as the individual's inner sense found perhaps the most significant outward expression in the large community of joined voices uniting and agreeing as one which choral singing – perhaps uniquely – facilitated. Here, abstract philosophical ideas were turned into something tangible.

Studying Choral Singing Across History

Choral societies were a powerful statement of the demand for a community of singers and the desire to feel the effects of coming together as a single voice. They became a physical manifestation of a moral physiology that resonated with common forms of self-perception as they framed the interaction of external stimuli, the mind, the body and emotions in ways that could be perceived in daily life. Yet, this happened at a crucial time during which mechanical explanations for the power of music were falling out of favour with philosophers and soon also with medics. The focus shifted onto the a-physical mind instead, in a broad trajectory in which the concept of nervous stimulation prevalent in eighteenth-century Britain was replaced in the nineteenth century by approaches that focused on mental operations and, since the mid-twentieth century, particularly on the brain (Kennaway, 2014; Thormählen, 2019a, 2019b).

It is notable that interest in the mechanical effects of acts of engaging with music, be it through listening or through singing, has resurfaced in recent scientific research. What was once considered a stimulation of fluids or later, nerves, is now measured in heart rate and hormonal activity. Hormones in particular are considered to be intricately allied with emotions, while some of them are also markers of potential health as they function as markers of immune competence (Kreutz et al., 2004; Fancourt in this *Companion*). While the protein S-IgA, for instance, is "considered as the body's first line of defense against bacterial and viral infections of the upper respiratory pathway" it has also been shown to respond to emotional states (Rein & McCraty, 1995). If music, therefore, has a positive effect on our emotions, this will have a positive impact on our immune system; thus the relationship between music and health is established, it seems.

While this appears to be a fairly straightforward and potentially exciting line of defence for the use of music in health settings, there are a number of issues to consider. First, we face the key question of the relationship between music and emotions as a cultural construct that has changed considerably across history. In fact, a large number of studies on listening in particular have revealed that music's emotional effects were far from consistent and that they relied heavily on personal circumstances and social settings. Choral singing, on the other hand, appears to show a greater consistency of results related to a positive improvement of well-being. Here, though, any benefits indicated by biomarkers such as heart rate variation and stress hormone levels (in other words the

material, measurable changes), have not been shown to have long-term effects. However, the perceived health benefits of choral singing as reported through interviews and other psychological measuring scales serve to suggest that a wider incorporation of choral singing into core medical care particularly for patients with long-term conditions may indeed be beneficial and may exceed the benefits of listening to music. However, this long-term impact on individuals' perceptions of well-being is predominantly expressed in relation to social interaction, social cohesion, communality and belonging, identity, faith and collective achievement.

Thus music's emotional benefits have been successfully established within our Western society, not least because we have created a philosophical framework for it that has been amply articulated through historical as well as scientific studies. The next step, however, is to consider the latent question of an implementation of music into healthcare. Here, we face two issues: on one hand, in today's market-driven health economy, we need ways to justify investment in cultural activities and we need health and well-being categories that can measure a functioning society so as to bring cultural activities into the healthcare marketplace. On the other hand, we face the issue of living in a multi-cultural, multi-faith society, in which common associations with particular musical repertoires for instance or with particular settings cannot be assumed.

Examining the rise of choral singing suggests that the socio-political circumstances as well as popular belief systems suffused with contemporary theories of body and mind instigated its huge popular success. As such, the choral society was a particularly British phenomenon, rooted in belief systems that were particular to the British social, political, national and gender landscape of the late eighteenth and early nineteenth centuries (similar developments happen in other European countries but they take slightly different forms, see Minor, 2012; Applegate & Potter, 2002). The promotion of choral singing as a healthy activity both morally and physically, giving choral singing a status separate from other cultural activities that sprang up to fill leisure time, such as theatrical performances and shows, the opera and the music hall may have been medically framed yet it was ideologically determined. Strikingly, the sublimation of religious experience into a communal activity that was conducted in the secular sphere played a significant role here, a fact that bears striking resemblance to the secularised society in which experiments are conducted today. What is different today is the self-professed disunity of society of a new multi-cultural, secularised ideology. Science then – fallaciously seen as free from ideology and therefore cross-cultural – may be the only way forward, yet studies on music, emotion and well-being raise another fundamental question: how close are we to articulating such inherent human values, desires and needs as identity, social belonging and collectivity in parameters that we can measure and thereby universally account for?

Both approaches, the scientific and the historical, show the fallacy of a directional approach: on one hand, there is the scientific idea that external influences create internal reactions and that therefore internal markers serve as a straightforward measure for the strength of influence; and on the other we see the reverse logic of historical studies, namely that external events are manifestations of internal needs and desires. Neither engages with what appears to emerge as a universal desire: the desire to have a voice, to have agency in the "organisational self-creation." If we begin to account for self-direction in matters such as the setting of the activity, the repertoire sung, associational meanings (and with that for the possibility of quasi-spiritual influences) and if we account for the willingness to form new identities outside of these parameters rather than just within them, perhaps the historical and scientific approaches can come together to make a strong argument for a wider implementation of choral singing in educational and social contexts; such implementation reaches beyond the traditional health sector to promote the sense of well-being in individuals.

Note

1 See for instance www.telegraph.co.uk/news/health/news/10496056/Choir-singing-boosts-your-mental-health.html.

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8

THE USE OF MUSIC AS A TREATMENT FOR *GEMÜTHSKRANKHEIT* IN NINETEENTH-CENTURY VIENNESE PSYCHIATRY[1]

Andrea Korenjak

> [. . .] Thus, perhaps soon they will fade
> The beautiful inkling flowers of my soul [*Gemüth*];
> And when the growth of life has withered,
> Gone too are the birds, my songs [. . .].
>
> (Lenau, 1855, p. 219)
> Nicolaus Lenau (1802–1850)

Nicolaus Lenau's poem "The Jungle" [*Der Urwald*] reflects the idea of the "suffering of the *Gemüth,*" a characteristic nineteenth-century expression denoting a troubled "soul." Viennese society of the period increasingly recognised the benefits of music in the treatment of "those suffering from an illness of the soul" and the term was often central to wider understandings of music, emotion and the body. In this chapter, I will explain the German notion of *Gemüth* and *Gemüthskrankheit* (literally, "illness of the *Gemüth*") and give an overview of the use of music for the treatment of the mentally ill in a specifically Viennese context, with a particular focus on Bruno Goergen's (1777–1842) private sanatorium for the mentally ill [*Privat-Heilanstalt für Gemüthskranke*]. As a sufferer from an "illness of the *Gemüth*," Nicolaus Lenau himself died in Goergen's mental institution in Ober-Döbling near Vienna in 1850. Lenau is commonly seen as a poet *par excellence* of Romantic *Weltschmerz*, a "self-consuming melancholy" often identified in poets and writers of the *Biedermeier* period (c. 1815–1848). According to his biographer, Ludwig August Frankl (1810–1894), Lenau was convinced that "the whole secret" to finding relief from his malady would reside in music and that a "completely different therapeutic system" could be created from music, an idea that reflected a general contemporary interest in music therapy (Frankl, 1854, p. 117).

However, while Goergen focused on the *Gemüth* and recommended music, literature, "cultivated conversations" as well as walks in the sanatorium's own park to distract his patients from their "racing thoughts" and "feverish imagination," a separate and distinct theory began to emerge in medical science that mental illness may be caused by a functional disorder of the brain

(Griesinger, 1845, p. 1). New hypotheses on neurological conditions supported developing concepts of brain function and dysfunction. Whereas Goergen was primarily concerned with the moral and mental *treatment* of his patients, other psychiatrists and neurologists were more focused on the *aetiology* of mental illness. For instance, Maximilian Leidesdorf (1816–1889), who took over Goergen's asylum in 1860, acknowledged the feeling of "psychic pain" as one of the most frequent signs for the genesis of mental illness but also postulated seeing the brain as the central organ of mental disease (Leidesdorf, 1860, pp. 1, 2).

As regards music therapy, although the belief in music's immediate impact on the nerves and its further consequence on the brain was widespread in the first half of the nineteenth century, a simple "stimulus-response-mechanism" could not be demonstrated in treatment. The reliable measurement of music's effect on physical parameters such as heart rate or skin resistance, as well as the medical imaging of music's impact on the brain, would take more than a hundred years to come (see Kennaway and Quiñones in this *Companion*). For that reason, music therapy and thinking on music and emotions often continued to focus on the idea of music's beneficial effect on the soul or *Gemüth*. The vague and broad term *Gemüth* offered a similar indistinct concept for mental illness [*Gemüthskrankheit*] and its therapy through music. (In the second half of the nineteenth century the spelling of *Gemüth* changed to *Gemüt*.) In order to clarify the scope of its particular meaning in the nineteenth-century context, I will outline how the term *Gemüth* was increasingly identified with the realm of the soul and the emotions around 1800. In addition, nineteenth-century Viennese medical dissertations reveal that the development of empirical observation gave rise to new considerations on the interrelationship between the effect of music on the patient's emotional state or mood and the patient's musical education, preferences and individuality.

Music and the Beginnings of Psychiatry

Around 1800, the emergence of psychiatry as a discipline and the establishment of psychiatric institutions ignited a renewed interest in music and its impact on the soul and body, particularly on the nervous system. At the end of the eighteenth century, what would come to be called "psychiatry" began to evolve into a distinct medical discipline, entailing a paradigm shift from the "treatment of lunatics" toward a "mentally curative method" (although coercive treatment occurred simultaneously and continued far beyond the nineteenth century). At the beginning of the nineteenth century, there was a noticeable increase in the use of music in psychiatric institutions, particularly in France, Germany and England. Some of the most important founders of modern psychiatry argued in favour of the use of music in psychiatric treatment. Philippe Pinel (1745–1826), for example, noted that "[a]ll observant physicians grant music a high ranking amongst the remedies used in the treatment of nervous diseases" (Pinel, 1798, p. 128). Unlike older models of music therapy such as those based on the four humours or on the *spiritus* (see Pelosi, Hicks, Prins and Gouk in this *Companion*), the application of "medical music" at that time was confined primarily to the area of "mental/nervous diseases" or "mental disturbances." In this context, the German physician and music specialist Friedrich August Weber (1753–1806), referring to Brown's concept of sthenia and asthenia, indicated that "only on the physical symptoms inherent in the category of nervous diseases can the application of music be expected to produce something beneficial" (Weber, 1801/1802, col. 567; see also Brown, 1780). While Viennese physicians refer to music's healing potential to cure actual physical illness, most commonly they provide second-hand reports of single cases, initially reported by other physicians rather than reporting first hand experience. Throughout Viennese medical writings, music was mostly considered beneficial in the case of "neuroses" and mental illness in general (Denk, 1822, pp. 45–56; Popelka, 1845, p. 25).

With the establishment of institutions specifically designated for the mentally ill, the "power of music" was tested in the emerging field of clinical psychiatric practice. These newly created mental

institutions provided suitable conditions for the clinical observation of a larger group of patients and complied with the increasing demand for experimental evidence. Beliefs in the legendary healing powers of music handed down since Antiquity, such as the anecdote that Pythagoras himself cured drunken youths simply by changing the musical mode they listened to, could no longer be maintained when confronted with practical observations collected in mental institutions (for further context on Pythagoras's theories see Pelosi in this *Companion*). The empirical evidence gained through daily psychiatry dispelled the myth of a "universal" healing music. Moreover, some physicians observed that music was also able to provoke negative reactions (see Kennaway in this *Companion*). Both Pinel's pupil Jean-Étienne Esquirol (1772–1840), who conducted musical experiments on a systematic basis in the 1820s and Gottfried Langermann (1768–1832) described cases in which patients fell into a rage through music (Esquirol & Hille, 1827, p. 157; Langermann, 1845, pp. 581, 582). Nonetheless, Esquirol noted that music can bring relief through distraction and soothe physical and emotional suffering. He therefore concluded that music is doubtlessly beneficial for convalescents (Esquirol, 1838, p. 225).

Although some physicians of the time called for their colleagues employing music in psychiatry to produce thorough and methodical evaluations of evidence related to musical treatment, such analysis – with the exception of Peter Joseph Schneider's (1791–1871) *System einer medizinischen Musik* [*System of Medical Music*] (1835) – is generally difficult to trace in the historical record. However, the generally very short and scattered references concerning the salutary effects of music in many writings of the eighteenth and nineteenth century reflect the difficulty of systematically classifying music-related observations rather than a lack of interest in music. Due to the fact that music as a therapeutic modality is embedded across a range of disciplines, including psychiatry, medicine, music philosophy and aesthetics, historical examples concerning the *concrete* use of music in psychiatric institutions turn out to be, unsurprisingly, markedly diverse.

Nevertheless, clinical insights began to further an increasing awareness among physician of a patient's personality, such as an individual's general frame of mind, previous musical training and listening habits. These new insights were also reflected in Viennese medical dissertations of the nineteenth century. For example, Rudolf Leubuscher (1822–1861) emphasised the "[mental] state" of patients as well as their musical education in his *Handbuch der medicinischen Klinik* [*Handbook for the Medical Clinic*] (Leubuscher, 1861).

Music in Viennese Psychiatry: Bruno Goergen's Private Sanatorium for the Mentally Ill

The ideals of the Enlightenment (freedom, equality, respect for the individual) and neo-humanism (humanity, moral education, *Bildung* in the sense of *studia humanitatis*) led to a general reconsideration of society's treatment of the mentally ill, resulting in the emergence of a philanthropic mission in cities throughout Europe. Inspired by French psychiatry, a new attitude toward the mentally ill was formed (*traitement moral*), based on such salient features as "gentleness on the part of the physician," a "high degree of personal freedom," and "an emphasis on mental engagement" (Kratzmann, 1846, pp. 254, 255). However, the broad realisation of "humane psychiatric conditions" needed many more decades of reform.

In 1781 the Austrian Emperor Joseph II (1741–1790) ordered the reorganisation of public welfare, creating a separate institution for the mentally ill, the Imperial and Royal Lunatic Asylum (later known as the "Fools' Tower"). Commissioned by the physician Joseph von Quarin (1733–1814) as Europe's first institution *exclusively* for the mentally ill, it was part of a broader shift throughout Europe, with the mentally ill emerging as a distinct group from the "polymorphous mass of the poor" (Scheutz, 2003, p. 77). The social reforms of Joseph II should not, however, obscure the fact that music found its way into Viennese thinking on mental illness at a relatively

late date (Korenjak, 2016, pp. 187, 188). In the beginning, the use of music in treatment was usually confined to Viennese private mental institutions. It was reported in 1817 in the *Medicinische Jahrbücher des kaiserlich-königlichen österreichischen Staates* [*Medical Annuals of the Imperial and Royal Austrian State*] that all those in Vienna's "Fools' Tower" who were able to pursue a hobby (not requiring tools potentially harmful to themselves or others) were variously occupied depending on their condition with writing, drawing, painting or music, but later descriptions of the asylum suggest that conditions were primitive and that such efforts had been discontinued (*Medicinische Jahrbücher* 1817, p. 45; Walber, 1844, p. 267; Mahir, 1846, p. 129).

One of the most prominent advocates of the use of music in Viennese psychiatric institutions was Bruno Goergen, a native of Trier who earned his medical doctorate in Vienna in 1800. From 1805 to 1808 Goergen was the chief physician of Vienna's Imperial and Royal Lunatic Asylum, where he employed music in the treatment of the mentally ill (Wittelshöfer, 1856, p. 185). In 1819 Goergen founded his *Privat-Heilanstalt für Gemüthskranke* (*Private Asylum for the Mentally Ill*), a private sanatorium in the Palais Windischgraetz in Gumpendorf, a well-to-do suburb of Vienna at that time (today Vienna's sixth district). This sanatorium, considered to be the first state-licensed private mental institution in Austria, was relocated to Ober-Döbling (now Vienna's nineteenth district) in 1831, where Goergen adapted the Henikstein villa for curative purposes (the building is currently used as the Döbling district courthouse).

Little is known about Goergen. One of his successors, Heinrich Obersteiner Junior (1847–1922), described him as a man with an energetic and uncompromising character who seemed to be slightly introverted due to his harsh experiences in life (1921, p. 104). As a proponent of the idea of non-restraint, Bruno Goergen proscribed chains, belts, as well as the straitjacket and advocated the idea of mental "engagement," as well as distraction and amusement through well-chosen recreational activities. He lived with his family in the sanatorium complex and shared meals with his patients, not least in order to serve as a model for decent behaviour. Doubting the "moral qualities" of regular psychiatric staff, Goergen preferred, according to Obersteiner, to use the physically disabled as caretakers. They were expected to have a minimal educational level akin to that of a primary school

Figure 8.1 Private Sanatorium in Upper-Döbling, founded by Bruno Goergen

Source: *Die Privatheilanstalt für Gemüths- und Nervenkranke zu Ober-Döbling bei Wien seit ihrer Gründung* (1867), ed. by Heinrich Obersteiner (no page number). Vienna: Karl Czermak. By courtesy of the Josephinum, Ethics, Collections and History of Medicine, MedUni Vienna, book number 30.023

Figure 8.2 Private Sanatorium in Upper-Döbling, "Salon on the First Floor" (piano on the far right)
Source: *Die Privatheilanstalt zu Ober-Döbling* (1891), ed. by Heinrich Obersteiner. Leipzig and Vienna: Franz Deuticke, p. 32. By courtesy of the Josephinum, Ethics, Collections and History of Medicine, MedUni Vienna, book number 2.308/2

teacher. In addition, they were required to give the patients support by serving as a guide, friend and companion. Goergen intended to have 70–80 caretakers for 100 patients. His ideal, however, was a psychiatric institution without any minders at all. (Obersteiner, 1921, p. 104).

In Vienna's private mental institutions, the use of music was linked to neo-humanist educational ideals as well as to the idea of music's beneficial effect on the soul. Music counted as a mental engagement and was seen alongside other educational activities as means to strengthen the personality in general and to distract from or prevent madness (Feuchtersleben, 1845, p. 357). In his report on the *Private Asylum for the Mentally Ill*, Goergen referred to a large, beautiful, vaulted salon in his sanatorium that was dedicated to gatherings, to carefully directed conversations and games and in particular, to the display of or interaction through music and literature appropriate for the mentally ill. Patients were offered their own library, comprising about 2,600 books, as well as magazines and international newspapers.

Goergen promised to offer lessons in languages, music and other subjects to every patient whose upbringing and education had been interrupted by their mental illness. It is important to bear in mind that the private sanatorium in Döbling and private mental institutions in general were usually accessible only to a wealthy clientele and the nobility, who expected their cultivated lifestyle to continue. Whereas a stay in "Fools' Tower" cost 18 kreutzer, the treatment in Bruno Goergen's private sanatorium cost three to five guilder a day, more than ten times as much.

In 1832, Anselm Martin noted that the patients' rooms in the sanatorium were furnished with musical instruments, particularly with pianofortes. The patients were not only given the opportunity

to deepen their musical skills, but also to take music lessons from teachers who were specially employed by Goergen for this purpose (Martin, 1832, p. 157). With regard to music as a means of healing, Goergen's approach was to keep his patients mentally engaged for the purpose of distracting them from their morbid thoughts, for example through concentrating on each musical note (Goergen, 1820, p. 26). Thus, Goergen argued that patients should not only enjoy music by listening, but should also be encouraged to play music by themselves and together as an ensemble. In support of his argument Goergen pointed to experience gained during his previous position as director of the Royal and Imperial Lunatic Asylum, where he had the inmates perform the "most difficult musical productions," which were also admired by music connoisseurs (Goergen, 1820, p. 26).

Goergen's private sanatorium also included a theatre and concert hall, where patients could perform their plays and musical pieces (Martin, 1832, p. 157). Johann Benjamin Popelka, who completed his medical dissertation on music in 1845, explicitly referred to Goergen's example when he recommended that patients should give joint "asylum concerts" almost every week, where "pleasant guests" such as relatives or the sanatorium's personnel should be invited. The applause given by the audience would strengthen the patients' confidence and encourage their musical pursuits (Popelka, 1845, p. 28).

In 1876 five pianos and one harmonium were present in the sanatorium; of these, two pianos were located in the "ladies' conversation salon," another in the men's salon. In 1891 thirteen pianos were provided by the sanatorium. In addition to music, hobbies such as needlework, drawing, painting and colouring were likewise seen as "purposeful occupations" for the patients (Obersteiner, 1876, p. 89). According to Obersteiner, music was regarded as possessing one of the greatest healing powers. The musical skills and breadth of repertoire demonstrated by the patients were remarkably high:

> Occasionally, educated voices unite to form an *a cappella* quartet, be it a mixed or a male quartet or to form small ensembles; old and new church arias, classical operatic arias accompanied by a string quartet have been performed; almost all forms of chamber music, string and piano trios, quartets, quintets have been regularly executed in a serious and correct manner on musical evenings, partly by the patients, partly by other artists and art lovers.
>
> (Obersteiner, 1891, p. 101)

Obersteiner was convinced that music has an influence on the patients' instantaneous "mood," and an even stronger influence on the musical performer (Obersteiner, 1876, p. 89). However, he did not entrust all patients with musical instruments because he observed that music could intensify some patients' morbid sentiments; thus, patients were provided with a piano or other instruments, but always with due consideration of their specific "mental state."

Gemüth and *Gemüthskrankheit* and their Meaning in the First Half of the Nineteenth Century

Viennese conceptions of music, emotions and mental illness in this period were often framed in terms of the idea of *Gemüth*. The *Gemüth* was often seen as an intermediary realm between the mind and the soul. According to the Viennese poet and physician Ernst von Feuchtersleben (1765–1834), the soul could rarely be touched through the mind alone, but easily through the *Gemüth*, the "epitome of the feelings and inclinations" (Feuchtersleben, 1845, p. 357). Music was not only seen as an expression of the *Gemüth*, but also as "a means of psychic healing" (Feuchtersleben, 1845, p. 351). Conversely, in the case of a "troubled soul" the *Gemüth* was thought to be affected, too.

Remarkably, Bruno Goergen designated his mental institution as specifically for "patients suffering from an illness of the *Gemüth*," although other diagnoses can be found in the sanatorium's patient records. Particularly in the context of private institutions, the psychiatry of the Biedermeier period in Vienna was influenced by the notion of a *Gemüthskrankheit*, an "illness of the *Gemüth*." As Cheryce Kramer has noted, the concept of *Gemüth* was omnipresent in the Biedermeier period (Kramer, 2000, p. 138). The term itself, however, is elusive and historically variable and it is important here to bear in mind that the meaning and cultural understanding of *Gemüth* as well as of *Gemüthskrankheit* changed considerably over time. Concomitant with its confinement to the realm of the emotions and the inner world, in the Biedermeier period the *Gemüth* was often romanticised and associated with softness, mirth, contentment and sentience.

As Kramer shows, the German sanatorium Illenau, which opened in 1842, was especially geared toward the concept and treatment of the *Gemüth* as a "soul-organ." Interestingly, the German physician Christian Friedrich Roller (1802–1878), who headed this model institution from 1842 to 1878, referred to Bruno Goergen by name when noting that social feasts elicit the merriment of attendees, raise the enjoyment of life and promote a familial living environment (Roller, 1831, p. 208). Both Roller and Goergen were convinced that the *Gemüth* could be affected beneficially by music and other "amusements," not least due to the centuries-old belief that music could appease a restless soul (i.e. the *Gemüth*).

In Vienna, *Gemüthskrankheit* appeared to afflict the sanatorium's upper class and aristocratic clientele in particular. It does not seem coincidental that Bruno Goergen generally avoided more discriminatory terms, such as "insanity," "madness," or "lunacy." On the whole, Goergen's clinic conveys the impression of an up-market Biedermeier retreat based on the principles of dietetics (*res non naturales*), rather than a typical nineteenth-century asylum for the mentally ill.

Whereas today *Gemüth* is almost automatically translated into English as "soul," "temper," "disposition," or "mind," in earlier historical contexts the term's meaning is more complex. The notion of *Gemüth* and its related illness [*Gemüthskrankheit*] transformed over time, demonstrating that concepts of the mind, the soul and the emotions are historically contingent. Even with the advances in understanding of the role of the brain in mental illness, the idea of *Gemüth* did not vanish, but was initially integrated into "(phrenological) brain mapping." Wenceslaus Bauer, for instance, argued that since music has an impact on the brain via the sense of hearing, it also affects those parts of the brain that preside over the emotions or movements of the *Gemüth* [*Gemüthsbewegungen*] (Bauer, 1836, p. 11). In the following section, I focus on the concept of the word *Gemüth* as prevalent in the first half of the nineteenth century.[2]

As the Grimm Brothers point out in their *Deutsches Wörterbuch* (*German Dictionary*), the term *Gemüth* originally denoted not only the concepts of "feelings," "sentiments," or the "soul" in general, but until the nineteenth century also the faculties of "thought," "mind," or "reason" (Grimm, 1873). Around 1800, the term *Gemüth* appears increasingly as a synonym for the soul and was often defined in contrast to the "mind," which was in this case denoted by the term *Geist* (Scheer, 2011, p. 51). This change in meaning is mirrored particularly in dictionaries of the early nineteenth century that were specifically addressed to a bourgeois readership.

In his *Wörterbuch der Deutschen Sprache* [*Dictionary of the German Language*] (1808), Joachim Heinrich Campe (1746–1818), defined *Gemüth* as "the entire appetitive faculty of man, both the rational [*vernünftig*] and the sensorial [*sinnlich*]," but remarked that "over the last few years it has become a fashionable expression for the soul," while also being used to denote a person's "disposition," whether this is good, noble, bad or wicked (Campe, 1808, p. 304). The idea of *Gemüth* as an "inner principle" animating activity continued to be influential. The philosopher and editor of the *General Dictionary of Philosophical Sciences* (*Allgemeines Handwörterbuch der philosophischen Wissenschaften*) Wil[l]helm Traugott Krug (1770–1842) described it as "the inner principle which eminently sets us in motion, that is, the appetitive faculty, from which a lot of feelings, inclinations

and disinclinations, affects and passions emerge and which are therefore called movements of the Gemüth" (Krug, 1833, p. 186).

The idea of the soul/*Gemüth* as a "moving" and "animating" principle can be traced to Greek Antiquity (see Pelosi in this *Companion*). Moreover, the idea that the "[physical] movement" of music (for instance, via sound waves) can also affect the "movements of the soul" is of ancient Greek origin. According to Plato, it was the Muses who bestowed on humans a type of inner harmony consisting of "movements" related to the "circulation of the soul" within us (Plato, 1992, p. 73; see Pelosi in this *Companion*). For Krug, both the *Gemüth* and the mind [*Geist*] constitute the soul, whose expression can be more strongly influenced either by the *Gemüth* or by the *Geist*. He differentiated between the more "practical" and the more "theoretical" faculties of the soul, the practical manifesting itself in the realm of the *Gemüth*, the "theoretical" in the realm of the *Geist*. In this context, Krug also uses the metaphors "heart" for the *Gemüth* and "head" for the mind.

"Illness of the *Gemüth*" Versus "Calmness of *Gemüth*" as the Soul's Ideal State

In the eighteenth century, Johann Heinrich Zedler (1706–1751) defined "illnesses of the *Gemüth*" simply as illnesses resulting from "movements of the *Gemüth*" and from a "restless soul" (Zedler, 1735, col. 829). Interestingly, the author points to a "psychosomatic aspect" of this illness, noting that patients suffering from *Gemüthskrankheit* could usually be identified by accompanying ailments of the stomach and bowels. Referring to similar ideas proposed by the Roman professor of anatomy Giorgio Baglivi (1668–1707), Zedler recommends music as the "best solace" amongst all remedies for patients suffering from *Gemüthskrankheit* (Zedler, 1735, col. 830).

In the *Oeconomische Encyklopädie* [*Household Encyclopedia*], the Galenic principles of dietetics – including music – are recommended in the treatment of *Gemüthskrankheit*. In the 1805 edition, music is regarded as a "true remedy" for all of the so-called illnesses of the *Gemüth*, since music affects the nerves instantly and thereby also the soul and body (Krünitz, Floerken & Flörke, 1805, p. 580). Nonetheless, the music used for such treatment must be chosen for each individual by a physician with a musical education. A physician who prescribed the same music in all cases of mental illness without making a distinction would act just as unreasonably as one who decided to cure each fever with the same type of pill (p. 580). Remarkably, for Krünitz et al., virtually *any* illness can be considered a *Gemüths-Kranckheit* (Krünitz, 1779, p. 307).

Immanuel Kant's (1724–1804) thoughts on *Gemüth*, as well as on the emotions and passions, found their way into medical-psychiatric discussions. For Kant, being under the sway of one's emotions [*Affekte*] and passions [*Leidenschaften*] is almost always indicative of *Gemüthskrankheit*, since both of these affective displays preclude the dominance of reason:

> Emotion acts like a watercourse that breaks through a dam; passion, like a torrent that digs ever deeper into its riverbed. The impact of emotion on health is like a stroke; that of passion like consumption or emaciation. Emotion is like a drunken binge that one sleeps off, even though it's followed by a headache; passion must be regarded like a sickness that comes from swallowing poison or like being crippled, which requires an inner or an outer doctor of the soul, one who knows how to prescribe remedies that are mainly not radical, but almost always merely palliative-curative.
>
> (Kant, 1839, pp. 277, 278)

In general, passions were seen as "forceful movements of the *Gemüth*" (Zedler, 1735, col. 191). Historically, it has generally been accepted that the "ideal state" of the "soul," the "mind," and the "affects" or "senses" is a "calmness of the *Gemüth*" (Walch, 1740, cols. 1173, 1174). In his

two-volume *Darstellung des menschlichen Gemüths in seinen Beziehungen zum geistigen und leiblichen Leben* [*Description of the human Gemüth and its relation to mental and physical life*] Michael [Mihály] von Lenhossék (1773–1840) defines the term *Gemüth* as the "individual state of the soul" which allows the soul to be touched by means of the body and the body to be affected by means of the soul (Lenhossék, 1824, Vol. 1, p. 282). Although according to Lenhossék the *perfect* "calmness of the *Gemüth*" (*tranquillitas animi*) is unachievable, there is a "seeming calmness of the *Gemüth*" which manifests itself through the "absence of the more vivid feelings and desires" and quite often occurs in pleasant entertainments [*gemütliche Zerstreuungen*] (Lenhossék, 1825, Vol. 2, p. 5). This Biedermeier notion of "cosiness" [*Gemüthlichkeit*] was also mirrored in the contemporary revival of salon music [*Hausmusik*]. Von Lenhossék and Goergen were convinced that *appropriate* amusements such as music, were "one of the best psychic remedies" (Lenhossék, 1825, Vol. 2, p. 115).

In order to entertain his patients, Bruno Goergen arranged small festivities with music and dance on several occasions, not only because of their supposed beneficial influence on the *Gemüth*, but also as a reward for "good behaviour." In the case of misconduct, however, Goergen excluded patients from these events according to the principles of "moral therapy."

Apart from his clinical report of 1820 Goergen did not publish on medical or psychiatric issues, neither did he elaborate on *Gemüthskrankheit*. In line with his contemporaries, Goergen used the term *Gemüthskrankheit* for a broad spectrum of mental illnesses, including "delusions." In his *Beobachtungen über den Wahnsinn* [*Observations on Madness*] (1806), the German physician, professor and poet Stephan August Winkelmann (1780–1806) pointed out the manifold aspects and different definitions of the term *Gemüthskrankheit* from a more medical and psychiatric standpoint. Winkelmann attempted to define its essence as follows:

> Gemüthskrankheit (*Mania*) is in general that state of human life in which the nervous system, namely the senses, are active, but in which consciousness is not possible. This impossibility of consciousness, simultaneous with the activation of the senses, is the [very] nature of the illness of the *Gemüth*.
>
> (Winkelmann, 1806, p. 19)

In this context, Winkelmann differentiates between three classes of *Gemüthskrankheit*: *amentia* [*Blödsinn*], *furor* [*Unsinn*] and *melancholia* [*Wahnsinn*].

Philipp Carl Hartmann notes an additional and similar aspect of *Gemüthskrankheit*. For Hartmann, a "disturbance of the *Gemüth*" is characterised by the prevalence of a single, inferior sentiment that dominates the whole *Gemüth* and draws the mind down from its superior purpose [*Bestimmung*] to a lower level of consciousness. Thus, according to Hartmann, one who suffers from a *Gemüthsstörung* is "taken into the narrow circle of a single feeling" (Hartmann, 1820, p. 44). Self-consuming melancholy, for example, was seen as belonging to this class of disturbances and was a typical Biedermeier diagnosis. It is also interesting to note that Hartmann already considered hereditary factors as a possible cause of disease.

In the general context of private mental facilities in Vienna during the first half of the nineteenth century, the interest in music's influence on the *Gemüth* is obvious: music does not only affect the *Gemüth*, music is the very "language of the *Gemüth*" (Lenhossék, 1824, Vol. 1, p. 495). For Johann Joseph Denk (c. 1797–1841), author of one of the earliest Viennese medical dissertations on music, it seems that nature has established a direct connection between the auditory sense and the *Gemüth* (in this case, best translated as "heart") because each state of the *Gemüth* expresses itself in characteristic and corresponding sounds (Denk, 1822, p. 27). In musical-aesthetic and poetic writing of the Romantic period, an "instantaneous connection" between the "ear," the *Gemüth* and "the heart," is often highlighted. Music is regarded as the "art of the *Gemüth*" (Hegel & Hotho, 1838, p. 129). In this context the German psychiatrist of the so-called "Romantic medical school," Karl Wilhelm Ideler (1795–1860), states that the "ear is the preferred sense of the *Gemüth*" (Ideler, 1838, p. 439).

In addition to such reflections on music and the *Gemüth*, Bruno Goergen was convinced that each musical note would further the patient's concentration by engaging the "inner" and "outer" senses. For Goergen this process was such a given that he did not deem it necessary to explain how and why such musical performances had a beneficial effect on the mentally ill (Goergen, 1820, p. 26). Unlike Ideler, who considered music as the "physic of the soul" (Ideler, 1827, p. 135), Goergen deemed his approach "the most salutary distraction" and "most beneficial (physical) occupation" (Goergen, 1820, p. 15), which included not only music, but also indoor and outdoor games, gymnastics, dance and other physical activities. Apart from the principles of "moral treatment" and the aspiration to attain a "Biedermeier composure," every citizen's engagement with literature and the arts was seen as an important means of "developing one's individuality," in accordance with the spirit of the neo-humanist educational ideal. Friedrich August Wolf (1759–1824) characterises this ideal as follows: "*Humanitatis studia* [. . .] comprise everything that furthers the education of human beings and the enhancement of all powers of the mind and the *Gemüth* to form a beautiful harmony between the inner and outer being" (Wolf, 1833, p. 45).

Music, Mental Illness and the Brain

As science-orientated and experimental medicine developed, new concepts of mental illness emerged. The medical conception of a nervous system that transmits impulses to the brain increasingly led to the awareness that mental illnesses may be caused by a functional disorder of the nervous system and brain. In his principal work *Die Pathologie und Therapie der psychischen Krankheiten* [*Pathology and Therapy of Mental Illnesses*], Wilhelm Griesinger (1817–1868) states on the first page that the *brain* must be the "starting point of psychiatry." In every case of mental disease, according to Griesinger, "madness" has to be recognised as an illness of the brain (Griesinger, 1845, p. 1). His statement could be considered revolutionary, since his predecessor Karl Wilhelm Ideler (1795–1860), had regarded mental illness as an expression of moral misconduct and its resulting punishment. In 1829, Franz Josef Gall (1758–1828) had also argued in his *Vollständige Geisteskunde* [*Complete Science of the Mind*] that mental illnesses, such as "mania" or "idiocy," could be merely seen as a "disturbance" of brain activities and functions, just as other diseases are considered disturbances of other parts of the body (Gall, 1829, p. 76). This idea of a "disturbed organisation of the brain" is also found in Philipp Carl Hartmann's book *Der Geist des Menschen in seinen Verhältnissen zum physischen Leben* [*The Human Spirit and its Relation to Physical Life*]: "[. . .] as Haydn and Mozart would have been unable to create harmonies on instruments out of tune, so the higher entity of the human spirit cannot manifest itself in a disturbed organisation." (Hartmann, 1832, p. 358).

An exploration of this so-called "disturbed organisation" became the declared goal of the emerging Viennese school of anatomy, established by Carl von Rokitansky (1804–1878) and Josef von Škoda (1805–1881). Even though Rokitansky and his wife, Maria Anna (neé Weis, 1806–1888 – a singer trained by Antonio Salieri – hosted a private music salon where she gave the first performance of Franz Schubert's *Erlkönig*, Viennese anatomists were far more focused on the "freedom" and "autonomy" of the "natural sciences," as well as on debunking beliefs associated with *physica speculativa*, rather than "medical music." And although some Viennese physicians such as Franz Schuh (1804–1865) and Theodor Billroth (1829–1894) were themselves remarkable musicians or other physicians such as Johann Peter Frank (1745–1821) or Maximilian Stoll (1742–1787) happened to mention music's benefit, they did not develop a "therapeutic concept," not even a rudimentary one. Franz Joseph Gall, for example, assumed "maniacs" and "idiots" had an intact "musical sense" (Gall, 1829, p. 349); however, he did not explore the possible "therapeutic" consequences resulting from this fact.

Therapeutic concepts of music's influence on the soul, mind and brain were often eclectic. For example, Hugo Kramoling in his book *Die Musik als Heilmittel* [*Music as a Remedy*] (1847) combined all the above-mentioned concepts of music's influence on the human body and soul:

> We call music the heavenly language of our otherwise silent heart and our *Gemüth*, whereby music, after having touched the nervous system (this touch occurs through sound waves reaching the auditory nerve, which are then conveyed to the brain and to other nerves), induces manifold feelings and movements in the *Gemüth*.
>
> (Kramoling, 1847, p. 8)

Knowledge that had been gained earlier in the field of experimental physics influenced an increasing tendency in the nineteenth century to provide a scientific explanation for the effects of music on the body. Whereas the doctrine of the humours had postulated a correlation between the "movement of music" (referred to as the idea "*musica movet affectus*") on one hand and "humoural flux" and the "movement of the *spiritus*" on the other, the theory of solidism attempted to explain the influence of music on (tissue) fibres and particularly on nerve fibres, as a result of the "vibrations" and "reverberations" of sound.

During this same time period, psychologists also tried to distance their discipline from philosophical ideas and to redefine psychology scientifically (even though the result seems to have been philosophical rather than scientific). In his *Versuch einer wissenschaftlichen Begründung der Psychologie* [*Attempt to Establish a Scientific Basis for Psychology*], Peter Jessen (1793–1875) argued that mental illness is caused by pathological dysfunction of the brain. Nevertheless, Jessen does not refute the existence of a soul (as a "subjective instance") and he differentiates between *Gemüth* and "mind" [*Geist*]. Whereas the "mind" [*Geist*] signifies the "objective" activity of the soul and the objective perception of the outer world, the term *Gemüth* indicates the "subjective" perception of the outer world, which is at the same time part of the "inner world" (Jessen, 1855, p. 366). The mind has to "translate" the feelings of the *Gemüth* into "thoughts" (Jessen, 1855, p. 367). Depending on whether the cerebrum or the cerebellum is affected, psychic illness manifests itself either as an "illness of the *Gemüth*" or as an "illness of the mind [*Geist*]" (Jessen, 1855, p. 261).

Considering the Patient's Individuality – Viennese Medical Dissertations on Music

Due to the fact that empirical evidence negated the notion of music's universal impact, new considerations and discussions of music and the patient's individuality emerged. Interestingly, these aspects are reflected in some of the first Viennese medical dissertations dedicated to music (e.g. Bauer, 1836; Denk, 1822; Hofgartner, 1847; Knöpfler, 1840; Kramoling, 1847; Popelka, 1845; Rosam, 1846). Although Johann Joseph Denk (c. 1797–1841) stated in 1822 in the opening "theses defendae" of his dissertation that noone is incapable of perceiving musical impressions and that the effects of music are most obvious with regard to both the *Gemüth* (soul) and the body, the idea of music as a *universal* remedy was basically abandoned in medical scholarship. In his dissertation *Ueber den Einfluß der Musik auf den Menschen im gesunden und im kranken Zustande* [*On the Influence of Music on Man in Sickness and Health*], Wenceslaus Bauer comes to the conclusion that music cannot be regarded as a "universal cure" (Bauer, 1836, p. 46). Moreover, Bauer warns against the idea of employing music in the treatment of the mentally ill without caution and the deliberate selection of a specific musical type or piece, for this would be as misguided as attempting to heal every kind of fever with the same drug (p. 44). Despite such reservations, all Viennese medical dissertations on music at this time period endorse the concrete application of music in medicine and psychiatry. While the historical references found in these dissertations are mainly aligned with discursive tropes popular since Antiquity (such as the biblical story of King Saul and David or theories about music's influence on the four humours, etc.), there are, however, some *new* aspects in this body of research that are noteworthy.

The first is the consideration of the patient's musical "preferences:" early nineteenth-century Viennese dissertations generally agree that a physician must be familiar with the patient's "receptiveness to music" and "force of habit" respectively (e.g. Bauer, 1836, p. 45; Lichtenthal, 1807, p. 172; Popelka, 1845, p. 27). In addition, musical pieces, instruments and modes have to be chosen by the physician in accordance with the patients' preferences and habits. For Johann Benjamin Popelka, a physician's consideration of the patient's particular "mood" [*Gemüthsstimmung*] is of utmost importance (Popelka, 1845, p. 28). In addition, the physician has to be aware that music affects well-educated people differently (usually more strongly) than the uneducated. Hence, folk music and "simple" tunes are recommended for musically uneducated patients and "more complex" music for "refined patients" (Hofgartner, 1847, p. 48; Knöpfler, 1840, p. 22; Rosam, 1846, p. 7).

The second is the consideration of the patient's education. Franz Carl Hofgartner points out the fact that aesthetic pleasure is intertwined with the "developmental stage of [one's] musicality" (Hofgartner, 1847, p. 19). According to Bauer and Hofgartner, music is particularly effective if it expresses the "natural language of the *Gemüth*" in a *simple* manner, especially with regard to less educated people. Following the ideals of neo-humanism, Bauer regards music an "excellent supplementary means of education" (Bauer, 1836, p. 35).

Another common interest which emerges from these writings is the consideration of nationality. While the idea that different ethnicities would be affected specifically by their own musical culture can be found as early as 1800 (See e.g. Weber, 1801/1802, col. 565), by 1840, there is a broad consensus that patients of different ethnicities should be therapeutically treated with their specific national or traditional music. Wilhelm [Gulielmus] Knöpfler and Franz Carl Hofgartner, for instance, describe the effect of patriotic music on the Hungarian patient: "If the brave Hungarian hears the sound of the "Rákotzy induloja" [the unofficial Hungarian anthem], he indulges himself in an ocean of the most pleasant feelings, he shouts for joy, he releases the moment from all bothering sorrows and he overcomes his grief" (Hofgartner 1847, p. 19; see also Knöpfler, 1840, p. 19; Kramoling, 1847, p. 18; Popelka, 1845, p. 19).

Finally, these treatises reveal the belief in gender specific aspects. In the nineteenth century, the received bias that a woman's nervous system is more irritable and sensitive than a man's was further reinforced (e.g. Hofgartner, 1847, p. 35). As James Kennaway has shown in his book *Bad Vibrations: The history of the idea of music as a cause of disease*, this prejudice concerning women's vulnerable nervous systems was especially revealed when describing music's negative effects (Kennaway, 2012). At the same time, in Goergen's sanatorium, for example, bourgeois women in particular were encouraged to continue their musical education. Obersteiner remarked on the considerable number of female patients with outstanding musical talents, who amused not only themselves but also others by playing music (Obersteiner, 1876, p. 22).

Franz Carl Hofgartner concluded his dissertation with the remark that the beneficial effects of music were appreciated far more "in the olden days." He wondered at the neglect of music in the medical discourse and practice of his time, "as medicine has enjoyed the most unbelievable progress in the last 50 years, not only in a diagnostic, but also in a therapeutic respect" (Hofgartner, 1847, p. 49). Hofgartner suggested that this was rooted in the "iatric ambition of the modern era," which is "more than ever focused on finding remedies that are more generally applicable and involved with lower costs" (Hofgartner, 1847, p. 49).

Conclusions

To summarise, in the first half of the nineteenth century, music was integrated into the world of Vienna's psychiatric institutions, most prominently in Bruno Goergen's asylum. Music was regarded as a "distraction," "useful entertainment," and "amusement," particularly for patients suffering from an illness of the *Gemüth* far more than as a "therapeutic agent" in terms of modern music therapy.

Nevertheless, a paradigm shift from passive listening to active playing of music is recognisable during this time (see also Thormählen in this *Companion*), a tendency reinforced by the fact that patients who could afford a private clinic were generally well educated in music. Clinical evidence led to new considerations of the benefits of music whereby physicians took into account the patient's musical education, listening habits, musical preferences and their specific mental states. Apart from stereotypical views on nationality and gender, by 1840 the patient's (musical) individuality was commonly recognised; this was an important step in the development of music therapy. Although Knöpfler still affirmed that music could be numbered among the most effective remedies (Knöpfler, 1840, p. 31), physicians were increasingly influenced by university medicine's orientation toward experimental scientific standards and therefore lost their professional interest in music, the effects of which they were unable to scientifically predict or control. The emerging focus on mental illness as a disease of the brain led to the dominance of biologically oriented medicine and psychiatry. Despite these developments, Bruno Goergen's successors continued to use music as a psychiatric treatment. Considerations of music's influence on the soul and body continued to be discussed in musico-philosophical and aesthetic writings.

Notes

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9

ANNA O.'S NERVOUS COUGH

Historical Perspectives on Neurological and Psychological Approaches to Music

James Kennaway

Introduction

In 1880 the Viennese physician Josef Breuer was called to treat a young woman called Bertha Pappenheim who was suffering from a nervous cough that appeared to be triggered by hearing dance music. She suffered acute mental distress and later went on to develop a range of other symptoms. Using the now-famous pseudonym of Anna O., the case became a foundational text in psychoanalysis when it was published 15 years later in the book Breuer wrote with Sigmund Freud, *Studien über Hysterie* (*Studies on Hysteria*) (1895). In a sense one could therefore go as far as to say that the whole psychoanalytical movement began with this clinical encounter sparked by the interaction between music and medicine. However, the auditory aspect was not emphasised by Breuer and has been essentially ignored since. Nevertheless, this chapter will argue that the case marked an important shift in thinking about the medical impact of music. Whereas previously medical views of music had often suggested that music's medical impact was as a form of *direct* physiological over-stimulation of the nerves, leading to symptoms of psychological (and physical) illness, Breuer and Freud suggested the reverse, that music's *indirect* psychological, emotional and symbolic position in Anna O.'s life had led to physical symptoms. Rather than seeing danger in music itself, Breuer, Freud and their successors thus understood the relationship between music and illness in terms of the mind, memories and imagination of the listener/patient.

The early twenty-first century is perhaps an appropriate time to consider the emergence of this psychological model of the power of music, since in some ways we are witnessing its decline in the face of the remarkable rise of a neuroscientific approach to music, which has drawn on advances in visualisation technology to revolutionise our understanding of the impact of sound on the nervous system (see, for example, Brust, 2001; Koelsch, 2012; Overy et al., 2012; Patel, 2003; Peretz & Zatorre, 2003; Stewart, 2007; Stewart, von Kriegstein, Warren & Griffiths, 2006). The shift from physiology to psychology that was marked by the Anna O. case has in some ways been reversed with the neuroscience of music, which has gone from being something of a neglected backwater in the 1970s to a highly significant subject today, with important research centres throughout the world. Its focus on music as primarily a matter of nerve stimulation rather than of subjective experience could be seen as a return to a neurological model of the relationship of sound and the brain that was already well established in the eighteenth century. This move towards a more materialist conception of music has at times been portrayed as the belated advent of serious science

in relation to the impact of music, leaving the psychoanalytical tradition effectively marginalised, questioning and often entirely denying its claims to scientific status (Torrey, 1992; Webster, 1996). At a time when Breuer and Freud's move from neurological to psychological explanations for the power of music is being overturned, an examination of the cultural determinants of this earlier shift might illuminate our current situation and perhaps shows some of the problems of any Whiggish assumptions of the inevitable progress of materialist views of music. This chapter seeks to show that these changing views have at times not been the result of any paradigm shift based on new data, but rather the result of shifting ideologies and cultures of music.

Music and Brain Stimulation from the Enlightenment to Charcot

The idea that music should be primarily understood in terms of the stimulation of the nervous system goes back to the seventeenth century (Kennaway, 2014). As older traditions of abstract ratio and cosmic harmony gradually retreated into the realms of poetry and occult esotericism, the physics of acoustics and the anatomy of hearing came to provide a basis for discussion of the power of music. The emerging science of the nervous system, pioneered by Thomas Willis and his work on the "doctrine of the nerves," laid the foundations for a range of theories explaining music in terms of its physical impact on the nerves (Willis, 1664). Willis himself argued for the existence of "sonorous particles" that transferred sound into activity in the brain via the animal spirits and the "nervous juice." As Penelope Gouk has pointed out, for Willis musicality itself was linked to having a soft cerebellum (Gouk, 2007). Similarly, René Descartes' explanation for the power of music related in part to the role of "a certain very thin air or wind called animal spirits" that move through the nerves, transmitting the impressions of the senses and controlling the body (Palisca, 2000, p. 306). Intermittently since then many observers have attempted to base thinking on musical aesthetics, music therapy and also ideas of dangerous music, on essentially medical models of music as a physiological stimulus.

By the eighteenth century, the conceptualisation of music as a form of nervous stimulation was becoming a commonplace, sparking sophisticated debates in a wide range of fields. Drawing not only on Willis but also on later physicians such as Albrecht von Haller and Robert Whytt, many writers on music therapy put forward a model of music that was strikingly materialist in a way that has clear parallels with our own time. A variety of theories about nerve function, including ones involving animal spirits, nervous fluid as well as vibrating, tightening and electrical nerves, powerfully influenced thinking on music (Nicolai, 1745). Richard Browne's 1729 *Medicina musica*, for instance, suggested that fast string playing caused the nerves to be "briskly agitated and give a brisk and lively Pleasure to the Mind, which by Sympathy will invigorate the Motion of the Spirits [in the nerves] and communicate a correspondent Sensation through the whole Machine." Slow music, conversely, would cause the nerves to be "finely and delicately touch'd and the Sensation be so exquisitely pleasing and ravishing as to cause the Spirits to flow back in gentle Undulations" (Browne, 1729, p. 36).

Musical aesthetics also sometimes drew heavily on this nerve stimulation model. In the works of J. G. Sulzer, Nikolas Forkel and J. J. Engel one sees a materialist conception of the power of music that in some ways prefigures modern neuroaesthetics (Engel, 1802; Forkel, 1788; Sulzer, 1771–1792; Zeki, 2008). Engel's 1802 *Über die musikalische Malerei* (*On Musical Painting*) argued for an aesthetic of musical emotions that focused explicitly on the nerves, stating that, "perceptions of the soul are inseparably connected to certain corresponding movements in the nervous system." (p. 313). Although a stimulation model of music's effects was widely accepted, a debate continued about the extent to which its impact was essentially a matter of physiology or of the subjective mind of the listener, addressing what remains a major question in music. The role of the imagination in the power of music was a key issue, as was the extent to which the imagination itself could be

explained materially as a "psycho-physical mechanism" (Welsh, 2001, p. 114). While some, such as Sulzer, stressed a narrower focus on the nerves and observers such as C. L. Bachmann combined ideas of music's direct neurological impact with a more subjective model based on its effect on the mind (Isliker, 1982), others were more sceptical. Richard Brocklesby's *Reflections of Antient and Modern Musick*, for instance, rejected the direct stimulation view (1749, p. 17). Likewise, Johann Joseph Kausch's *Psychologische Abhandlung über den Einfluß der Töne und ins besondere der Musik auf die Seele* (*Psychological Treatise on the Influence of Sounds and Especially Music on the Soul*) opposed what he called Sulzer's "mechanical" model of music (1782, p. 149). Kausch argued that there was an unbridgable "bottomless chasm" between neurology ("Nervenlehre") and the soul that limited what medicine could tell us about the experience of music, prefiguring aspects of the epistemological critique leveled against the neuroscience of music today (Kausch,1782, p. xii; Legrenzi & Umiltà, 2011; Tallis, 2011).

In musical aesthetics, the idea of direct nervous stimulation continued to be highly influential into the nineteenth century, often in the form of the aesthetic of feeling and sensation. However, the most influential mid-nineteenth-century work on musical aesthetics, Hanslick's *On the Beautiful in Music* (*Vom Musikalisch-Schönen*, 1854), consciously repudiated that approach. His aesthetic was a conscious rejection of the materialism of his eighteenth-century predecessors, but it is also clear that the Enlightenment model of music as stimulation made his abstract aesthetic possible by demolishing older metaphysical traditions of thinking on music. While acknowledging the achievements of the Positivist materialist science of his generation, he argued for music's special claim to be understood in abstract terms, distinguishing the aesthetic dimension from the merely mechanical hearing of sound (Burford, 2006). Hanslick admitted the reality of the "intensive impact of music on our nervous system . . . the invisible telegraph service between body and soul," but, like Kausch before him, doubted that physiology really had anything to tell us about the aesthetic character of musical experience (Hanslick, 1902).

Beyond aesthetics, the notion of the impact of music as essentially a form of physiological stimulation continued to be highly influential. Indeed, the nineteenth century saw a huge expansion of the medical debate on the potential dangers of such stimulation. Traditional moral critiques of music going back as far as Plato had focused on the perils of over-exciting the passions. The notion of the "passions of the soul," one of the Galenic six non-naturals that guided thinking on healthy lifestyle, provided a straightforward explanation for the dangers of music for the body and mind via the imagination and morals. In contrast to this moral tradition (and to the Anna O. case), by the 1790s the fundamental understanding was that music could directly over-stimulate the nerves and cause real mental and physical illness. Music was in part a physical stimulant like electricity or drugs, often understood in terms of a medical system dominated by ideas of stimulus. For example, the French natural philosopher Jean-Jacques de Mairan wrote in 1737 of the medical dangers of "the application of sounds, not harmoniously arranged or not suited to the patient's condition," as if speaking of a physical stimulant (Mathews, 1806, p. 13) and in 1807 the Viennese physician Peter Lichtenthal even talked of "doses" of music (Lichtenthal, 1807, p. 172). By the early nineteenth century such ideas were widespread. When in 1849 a contributor to the *Journal of Psychological Medicine* wrote of music that, "Too powerful, too sudden strokes, might occasion nervous convulsions, destroy the faculty of hearing or even extinguish life," he was entirely in line with much contemporary thinking in ascribing potential lethal powers to the direct impact of music on the nerves (Anon., 1849, p. 173). An elaborate discourse of pathological nervous music developed not only in medicine, but in aesthetics, philosophy and literature (Kennaway, 2012).

The sense of music as a matter of neurological stimulation continued to dominate medical views of music even as Hanslickian Idealism became more influential in aesthetics. Such explanations for the power of music as a potential pathological stimulant were reinforced in the period just before *Studies on Hysteria* by the international impact of Jean-Martin Charcot and his colleagues at the

Salpêtrière in Paris (Johnson, Lorch, Nicolas & Graziano, 2013), where Freud himself famously studied in 1885–1886. Charcot's central concern was to make hysteria a proper diagnosis by giving it a solid basis as a specific somatic neurological condition, depicting it as a matter of "higher reflex action," related to epilepsy. Causation was to be sought in heredity and in trigger factors such as alcohol, and to investigate the phenomenon he pioneered the clinical and experimental use of hypnosis. Hypnosis, he asserted, was also a matter of reflex action, not of suggestion – a model for his implied view of music that saw the patient as the passive recipient of stimulation.

Sound and music were not central preoccupations at the Salpêtrière but the approach there proved highly influential on thinking about music and found much resonance not only in science and medicine, but also in fiction and popular culture. Their fundamental argument about the impact of sound on the brain was that it should be understood in terms of automatic reflex action, not culturally-determined subjectivity. They conducted many musical experiments on hysterical patients involving gongs, lullabies and various instruments that appeared to have the power to trigger cataleptic fits. The discussion of acoustic stimulation in this context pays very little heed to any distinction between music and sound, leaving understandings of the former at an essentially physiological level. Thus Charcot's student Paul Richer, in his *Etudes cliniques sur l'hystero-epilepsie ou grande hystérie* (*Clinical Studies on Hystero-epilepsy or Grand Hysteria*), wrote that,

> The experiences . . . show the influence of sound vibrations (pitch, gong) on the various manifestations of hysteria . . . . In general, a violent noise caused disorder, deep emotion and a kind of hysterical crisis beginning with the clouding of intelligence and a few twitches in the arm.
>
> (Richer, 1881, p. 559)

Other Salpêtrière observations were more overtly musical. For example, Paul Regnard's *Les maladies epidemiques de l'esprit* (*The Epidemic Diseases of the Soul*) described a young female hypnotised hysterical patient experiencing "physiological suggestion" from the effect of "the sound of a piano or harmonium," which led to her "falling into ecstasy or dance" because of the "reflexes" provoked, resulting in "catalepsy" (Regnard, 1887, p. 273). Although subsequent observers have often ascribed the behaviour of the women to suggestion and even play-acting, Charcot and his colleagues approached the phenomenon as a neurological puzzle, a view that had significant repercussions for thinking on music.

At the time that Bertha Pappenheim suffered from her nervous cough, therefore, the idea of sound/music as a potentially dangerous, direct neurological stimulant had in many ways reached its height. The idea of thinking, not to think of listeners almost as neurological automata, merely responding to stimuli, proved influential. Max Nordau, a physician as well as author of the best-selling *Degeneration* (*Entartung*), explicitly compared Wagner's audiences to patients at the Salpêtrière hearing a gong (Nordau, 1896, p. 375). In some circles such thinking persisted into the twentieth century. The French psychopathologist Paul Farez, who studied in Paris just after the Charcot era, provides an interesting example. Although he was interested in hypnosis and suggestion and even wrote a pamphlet on French psychoanalysis, his 1912 article on "La Musique et la nérvosité" approaches music in terms of passive physical stimulation (Farez, 1912). He wrote that although music can help in nervous cases, it is also a potential cause of "déséquilibre mental," like other physical stimuli such as alcohol (1912, p. 5). In line with other such critiques, he suggests that older music such as that of Beethoven was fine, but that the dissonant chromatic harmony and modern lush orchestration of Schumann, Berlioz and especially Wagner causes "morbid nervous excitation" (1912, pp. 6–8). And there have been echoes of the notion of music as a stimulant akin to electricity affecting the passive listener in some scientific approaches to music (as Quiñones shows in this

Companion) and in the recurring panics about musical "brainwashing" ever since. However, as we shall see, by Farez's time thinking about music in terms of direct stimulation was already being challenged by a more psychological approach.

Anna O. and Music's Psychological Impact

The development of psychoanalysis would radically recast medical conceptions of listening, in a reaction against purely materialist conceptions of music. Josef Breuer, who already had a fairly substantial career as a physiologist behind him when he worked on the Pappenheim case, does not seem to have written much about music. There is surprisingly little on music in Freud's work, but much has been written about the interaction between Freud and the Viennese music scene of his day (Carpenter, 2010; Gilman, 1988; Kramer, 2015; Starcevic, 2013; Walter, 1946, p. 165). Despite living in a city with a famously intense musical culture, Freud himself was well known for his lack of musicality. He wrote that he was "almost incapable of obtaining any pleasure" from music because some rationalist "turn of mind in me rebels against being moved by a thing without knowing why" (Freud, 1914, p. 211). It is also true, however, that Freud's indifference or even hostility to music seems to have been rather exaggerated. Certainly his letters reflect an interest in opera (Baralea & Minazzi, 2008; Cheshire, 1996; Diamond, 2012; J, Roth, 1986; Slipp, 1993).

Although this chapter seeks to show that the Anna O. case marked a new era of thinking on musical stimulation, one should not overstate the influence of a single case. Often the name of Freud is made to stand for the entire shift from a neurological to a psychological paradigm, but he was also building on decades of work on somnambulism, hypnosis and the unconscious and several significant contemporaries such as Pierre Janet were thinking along similar lines. Freud was not the only one responsible for the sharp decline of the neurological approach pioneered by Charcot after his death in 1893 (James, 1952, p. 839; Munthe, 1929/2004, p. 207). Nevertheless, the Anna O. case was a marker for the future direction of thinking about music.

Between 1880 and 1882 Josef Breuer was consulted about the considerable distress and apparently hysterical physical symptoms of Bertha Pappenheim. Bertha, an intelligent young woman and the third daughter in a wealthy Jewish family in Vienna, is still remembered as Anna O. despite later achieving prominence as a social reformer (Edinger, 1968). Hers was the first case described in Freud and Breuer's *Studies in hysteria* and contributed to the creation of the psychoanalytic method not only as a subject, but also as an observer, herself coining the phrase "talking cure." Indeed, she has been described as "*the* patient who stimulated the growth of psycho-dynamic therapy" (Rosenbaum & Muroff, 1984, p. 1). Starting with the kind of hypnotic treatments familiar at the Salpêtrière and more specifically with Hippolyte Bernheim in Nancy, Breuer found that Anna O. was "quite closed to suggestion" because of her acute common sense (Breuer & Freud, 2004, p. 25). Instead, the most effective treatment appeared to be the talking cure, in which "symptoms disappeared" as they were "talked through" (2004, p. 38). Psychoanalysis spawned a cottage industry of reinterpretation of its classic cases and Anna O. has been no exception (de Paulo Ramos, 2003; Gilman, 1985; Hunter, 1983; Hurst, 1982; Thornton, 1983).

A daydreamer from a puritanical family background, Anna O. developed a pronounced squint and paralysis in her limbs at the age of 21. Her case, as set out by Breuer, went through distinct phases. The first began when her father, to whom she was very close, became ill in 1880. Breuer described it as a time of "latent incubation" in which she suffered from a *tussis nervosa* (nervous cough), intriguingly the symptom that first led to Breuer being called to treat her (2004, p. 27). This was followed by a more acute psychotic phase during which she developed a series of hysterical symptoms, including a *strabismus covergens* (double vision squint), contractures (akin to the cataleptics at the Salpêtrière), a paralysed arm, etc. Signs of improvement came to a halt at the death of her father in April 1881 that marked the beginning of the third phase, one characterised by "continual

somnambulism alternating with more normal states in a way that caused her to be moved to a sanatorium in June 1881" (p. 26). The final stage, in Breuer's account, involved a "winding down" of symptoms until June 1882, since when "she has enjoyed perfect health." As Henri Ellenberger showed, however, she left the clinic in 1882 addicted to morphine and chloral and was intermittently admitted to the Kreuzlingen sanatorium until 1887 (Ellenberger, 1972).

Crucially for our purposes, a central aspect of her condition was a nervous cough seemingly triggered by hearing certain kinds of music. As Freud and Breuer put in *Studies on Hysteria*,

> Her coughing first occurred when, as she was watching over the sick bed, the sound of dance music drifted over from a neighboring house, arousing a desire in her to be there, which awakened her self-reproaches. Throughout her entire illness her subsequent reaction to any kind of music with a strong rhythm was a *tussis nervosa*.
>
> (Freud, Breuer, 2004, p. 44)

Other signs of psychological distress related to hearing included "auditory disturbances" and hysterical deafness (p. 39). Breuer was conscious of the possibility of simulation, but explicitly argued that this was not the case. "It was incomprehensible to the patient that dance music should make her cough," he wrote.

> An invention like this is too meaningless to have been intentional, but I, for my part, could see that every scruple of her conscience caused her notorious spasm of the glottis and that the motor impulses felt by this girl who so loved dancing, turned this spasm of the glottis into a *tussis nervosa*. I therefore believe the statements of the patient to be perfectly reliable and truthful."
>
> (Ibid., p. 47)

Freud and Breuer's interpretation of Anna O.'s experience of music represents a key turning point in fundamental assumptions about the relationship between music and the mind, one brought about not by new scientific data, but by an innovative approach. At the Salpêtrière and for many nineteenth-century physicians in general, her symptoms would very probably have been interpreted as being caused by direct nervous stimulation in narrow physiological terms. In contrast, Freud and Breuer were clear that there was "no immediate physical cause" for her attacks (p. 35). Instead the *psychical* "stimuli" (a telling choice of word) behind the fits came from an "ideational complex" expressed in her "second state," from her "bad self" not from nerves and could only be understood in terms of mental states, symbolic relationships and repression (pp. 49, 50). Rather than treat music as a physical stimulant for the nerves, it was depicted as acting on the psyche, the memory and the imagination of the individual. However, having made that step, Breuer and Freud did not consider the cultural meanings and contexts of music or of particular styles or pieces, despite living in a city experiencing a profound and serious debate on music.

It is worth noting that, despite Freud's (supposed) antipathy towards music, his whole approach and that of Breuer, marked a clear shift from the visual world of the Salpêtrière to an auditory one. Charcot and his colleagues staged their patients in a self-consciously theatrical manner and pioneered the use of photography to record their work (Didi-Huberman, 1982). In contrast, Freud and Breuer's patients talked and were listened to intently, but their faces and identities were hidden behind aliases. The record of Anna O.'s auditory and oral symptoms, her lack of syntax and the descriptions of her mixing languages succeeded by a conversion to English only adds to this acoustic emphasis.

It is also worth considering the specific character of the music that disturbed Anna O.: dance tunes. Although Breuer used the language of "motor impulses," there was no suggestion, as there

might well have been if the case had been judged in Charcot's terms, that Anna O.'s cough was the result of the direct nervous stimulation involved in the rhythm or patterns of dance music. (For the contemporary Viennese debate on rhythm, see Graziano & Johnson, 2006; Wallaschek, 1893). The notion that music could lead to dancing because of *physiological* connection between the auditory and motor nerves, without any real need for the mind of the listener to be involved at all, had a long tradition. Back in the eighteenth century Kausch had disagreed with Sulzer's argument that music could so excite the nerves as to cause listeners to dance against their will due to the sympathy between sets of nerves (1782, p. 148). Hanslick had raised similar objections, writing that, "The feet don't move because it is dance music. Rather, it is dance music because the feet move" (1902, p. 143). In contrast to many other observers who argued that it was the nature of certain types of music – be it Wagner or jazz – that caused illness by stimulating the body, for Breuer the objective character of the music was in some ways irrelevant. The Anna O. case thus moved the focus from the music itself to the listener, but only his or her internal personal dynamic, not the cultural context.

Although the fact that Anna O. was a woman was not especially emphasised in Breuer's account of her illness and the role of music in it, throughout the nineteenth century there had been a substantial medical debate on the dangers of direct musical stimulation to women in particular (Kennaway, 2011b). To give just one example of many, in 1840 the Austrian physician Leopold Raudnitz argued that,

> one finds among women a greater sensitivity for music than among men, since the nerves of men have a much lower degree of sensitivity than those of women, whose nerves are very mobile and sensitive. Men are not as easily stimulated by external things, but women are easily excitable. This is especially true in early years, towards the time they near maturity, when a lively sound, a quick and unexpected transition from one key to another, stirs up their nervous energy in a remarkable way.
>
> (Raudnitz, 1840, pp. 41–42)

Much of this debate directly linked "weak" female nerves with gynaecology. It was widely believed that excessive musical stimulation of the nervous system could lead either to infertility or nymphomania (Kennaway, 2011a). A striking contemporary counterpart to Breuer and Freud in relation to the impact of music on hysterical patients can be seen in *Le langage musical et ses troubles hysteriques* (*Musical Language and Hysterical Conditions*) (1907) by the influential Argentinian Jose Ingenieros, who rejected psychoanalysis in favour of positivist, somatic conception of neurosis. He gave several case studies of women who appeared to suffer medical problems because of direct musical overstimulation, including a case of a violin student in Montevideo who had to give up her instrument because of hysterical musicophobia involving convulsions (Ingenieros, 1907, pp. 166–173).Typically, such symptoms were related to morbid sexual association – "a pathological association between music and the genital instinct" (p. 173).

Breuer's account of the Anna O. case clearly puts the experience of music in a very different context. The dance music that triggered her symptoms is explained in terms of traumatic memory, not physiological excitation. In part this was part of a wider reaction against the Salpêtrière model, whose claims to materialist scientific objectivity were undermined when their results were not replicated elsewhere. Rather than a paradigm shift driven by a new data-based theoretical framework, it was disappointment in the hopes for a Positivist mental science that led to a shift towards a more psychological approach. As far as music is concerned, the Freudian interpretation of music's effect on the memory and imagination of the listener marked a revival of a tradition that had never entirely gone away during the decades of the apogee of Positivist science. The Anna O. case thus marked the beginning of several decades in which the idea of listening as a question of passive reception of nervous stimuli was undermined by ideas drawn from dynamic psychoanalysis.

Music and the Psyche in the Twentieth Century

The first generation of psychoanalysts that emerged in the wake of Freud's early work included some who were interested in music. The Viennese music critic Max Graf, (famous as the father of Freud's patient "Little Hans") was drawn to Freudian methods to explain musical creativity, as he showed in his books from *Wagner-Probleme* (*Wagner Problems*) (1900) and *Richard Wagner im fliegenden Holländer: Ein Beitrag zur Psychologie künstlerischen Schaffens (Richard Wagner's The Flying Dutchman: A Contribution to the Psychology of Artistic Creation*) (1911) to *From Beethoven to Shostakovich: The psychology of the composing process* (1947). Karl Abraham, the founder of the Berlin Society of Psychoanalysis and a close colleague of Freud, wrote about the "Ear and auditory passage as erotogenic zones" in terms that both echoed older ideas of stimulation and Freudian precepts about sexual instinct. In general, though, his approach was conventionally Freudian. For instance, his view of a patient who experienced a "shudder" from military music bears no trace of the older approach (Abraham, 1942, pp. 115, 244–247).

The 1950s was in some ways the high point of the influence of psychoanalytical theories on music. The prominent Anglo-Austrian Hans Keller wrote Freudian interpretations of English music's neurosis vis-à-vis the continent (Keller, 2003; Wintle, 2003) and the Austrian-American analyst Heinz Kohut produced a series of articles on music and psychoanalysis such as "Some psychological effects of music and their relation to music therapy" in *Music Therapy* (1955); "Observations on the psychological functions of music" in the *Journal of the American Psychoanalytic Associatio*n (1957) and his *Observations on the Psychological Functions of Music* (1957). In the 1960s books like Anton Ehrenzweig's *The Psycho-analysis of Artistic Vision and Hearing* (1963) developed a dynamic psychoanalytical aesthetics and Robert Donington published his influential Jungian study *Wagner's Ring and its Symbols* (1969).

Throughout this period, neurological approaches to music remained in a comparatively somnolent state. Instead, the principal countervailing trend to a Freudian psychological approach to music and the brain was related to Pavlovian models of the mind: rather than seeing musical listening in terms of automatic reflex action as the Salpêtrière School had done, several leading mid-twentieth observers adopted Pavlov's concept of the *conditioned* reflex to explain music's impact. The English psychiatrist William Sargant, for instance, dealt with music in a highly reductionist Pavlovian manner (Sargant, 1974, 1985), portraying listening to music as a passive form of conditioned stimulation with potentially dangerous consequences. Sargant had attended the Nuremberg trials and feared that music could undermine rational self-control and amount to brainwashing. He quoted Aldous Huxley to the effect that, "if exposed long enough to tom-toms and singing, every one of our philosophers would end by capering and howling with the savages" (1957, p. 223) and suggested that Justus Hecker's discussion of the St Vitus Dance had prefigured Pavlov in showing the "physiological basis of morbid sympathy" (1957, p. 124). Sargant's main influence, however, was not on mainstream discussions of the impact of music, but on Cold War paranoia in thinking on music and reflex, fretting about Soviet "neuro-physiological research . . . brainwashing" and "thought control" and the Beatles (Kennaway, 2011a; Sargant, 1985, p. xxi).

Looking back on the debates on the power of music, one does not see a relentless march of scientific progress towards a thoroughly materialist conception of the nature of musical experience; but rather pendulum swings in favour and against a neuro-stimulation model of the power of music over the last 300 years. Pythagorean and Neo-Platonic traditions of cosmic harmony may have declined in the wake of the Scientific Revolution, but there have been regular reactions against a strictly materialist model of music's effects. For instance, the influential Idealist view of music that emerged in early nineteenth-century Germany was in part an attempt to overcome the stimulation approach to musical aesthetics of the late eighteenth century that seemed to threaten to reduce music to the level of mere physical pleasure, more like cookery or perfume than high art.

German Idealism's assertion that music (or at least serious music) was a matter for the transcendental subject, with only incidental physical effects, was a self-conscious rejection of the materialist nervous stimulation view. In turn, starting with Anna O., the Freudian rejection of the straightforward nervous stimulation model that dominated much of the discussion of pathological music is another example of an attempt to put the subjective experience of music at the heart of discussion of the subject.

The Revival of the Nervous Stimulation Model

The last 30 years have seen a marked shift away from that more subjective view. When Veith (1965) wrote her well-known book on hysteria in the 1960s, it seemed natural to finish with Freudianism. The situation today is clearly very different. For the last 30 years, Freud has been under attack on a number of fronts (Eysenck, 1985; Webster, 1996). Contemporary discussion of the impact of music suggests that in some ways we have gone back to a version of the nervous stimulation model that dominated the decades before Anna O. Although psychoanalytical approaches to music persist, for example in Julie Jaffee Nagel's *Melodies of the Mind*, they are arguably more marginalised than at any point since the 1920s (2013). As psychoanalytical approaches have seemed to decline, the neuroscience of music has massively expanded, becoming one of the most dynamic and interesting areas in the field since functional magnetic resonance imaging (fMRI) scans became common in the 1990s (Critchley & Henson, 1977). Neuroscientists who have investigated the impact of music have achieved remarkable things in this period. Their findings, for instance in terms of brain plasticity and multisensory integration, have dramatically improved our understanding of music's physical effects.

The music therapy that developed during the twentieth century included approaches based on a wide range of theories, from behaviourism to psychoanalytical traditions, combining Freudian, Jungian and Gestalt therapy concepts. For instance, the analytical music therapy of the British therapist Mary Priestley drew heavily on Freud and Jung, whereas the Nordoff-Robbins approach is based on humanistic traditions and Rudolf Steiner's anthroposophy (Kim, 2004). Others flirt more explicitly with esoteric echoes of cosmic harmony in their rhetoric (Hanser, 2016). It is clear, however, that the prestige and achievements of neuroscience has made it increasingly influential in the context of music therapy as so-called "Neurologic music therapy" (NMT) gains in influence. There has been significant interest, for instance, on rhythmic entrainment and rehabilitation from a neurological viewpoint, especially in terms of Parkinson's disease and stroke (Macdonald, Kreutz & Mitchell, 2012). In popular culture, too, the nerve stimulation model of music has been reflected in the widely discredited "Mozart effect," which suggested that cognitive improvement could be achieved by listening to Classical music (Rauscher, Shaw & Ky, 1995).

A similar story emerges if we consider the impact of neuroscience on musical aesthetics in the growing field of neuroaesthetics. Although music has received less attention than visual art, scientists such as Semir Zeki have attempted to find neural correlates to musical aesthetic experience (2008). In his *Splendor and Miseries of the Brain*, for example, Zeki attempts to give a neuroscienfic view of *Tristan und Isolde*. However, neuroaesthetics has been subject to a number of telling critiques in the context of "neuroscepticism" (Satel & Lilienfeld, 2015). Rather than attempt to overcome the limitations of current neuroscientific approaches to music by further experimental and theoretical work, observers such as Raymond Tallis have attacked many of the premises on which the whole enterprise rests. In his essay "Was Schubert a musical brain?" Tallis argues that fMRI and PET scan research that shows that music stimulates reward pathways in the brain tells us little about the experience of listening to music, for all that we might learn about the brain (Tallis, 2014; Di Dio Cinzia & Vittorio, 2009; Conway & Rehding, 2013). Although the historical angle is rarely mentioned, much of the contemporary critique of the neuroaesthetics of music echoes that of

Kausch and Hanslick in the 1780s and 1850s in questioning whether science can cross the "chasm" between measurable activity in the nervous system and the subjective experience of music. Explanations of the impact of music on the brain cannot escape the culturally and historically shaped meanings of music which frame that subjective experience, as sophisticated neuroscientific observers have themselves acknowledged (Eerola and Taruffi & Koelsch in this *Companion*).

Some have argued that a possible way out of this perceived impasse is to draw on the field of affective neuroscience developed by scientists such as Antonio Damasio (Damasio, 2000; Panksepp & Bernatzky, 2002). However, the relationship between music and emotion is by no means as clear-cut as some assertions in neuroscience that might suggest. What does it mean to suggest that music "expresses" or "elicits" emotions? While neuroscientific approaches to music require clear models of music and emotion, these questions are by no means entirely resolved in aesthetics. The key assumption that music is fundamentally a matter of reward circuits and physical pleasure is open to question. Many aestheticians have argued that music is not essentially about feelings at all, implicitly challenging the basis of the whole neuro-model of music (Hanslick, 1854/1902; Zangwill, 2004). It is striking that although neuroscientists often cite Leonard Meyer's *Emotion and Meaning in Music* (1956) because of his congenial theory of the role of emotion in music, they do not always follow his strictures against the dangers of the "errors . . . of hedonism," which he argues, can be found in the work of their predecessors Helmholtz, Wundt and Stumpf (Meyer, 1956, p. 5). Foreshadowing critiques of Pinker's "auditory cheesecake" argument, Meyer was clear that "a Beethoven Symphony is not a kind of musical banana split" (Meyer, 1956, p. 6), since simple physical pleasure is not necessarily the whole story of musical enjoyment. Future models of music, the brain and emotions would benefit from a clearer conceptual understanding of terms related to feeling, drawing on insights from the history of emotions that has shown the extent to which our whole terminology of emotion is historically determined (Dixon, 2003; Plamper, 2015; Reddy, 2001). A deeper historical and philosophical consideration about what a "musical emotion" is, incorporating insights from ethnography and psychology, could be as a useful step in providing a solid basis for scientific models of music's effects and many of the chapters in this *Companion* deal with that challenge.

Some observers hoping for a neuroscience of subjective musical experience, incorporating the music, listener and context, have also looked to so-called neuropsychoanalysis for insight. Appealing to Freud's *Projekt einer wissenschaftlichen Psychologie* (*Project for a Scientific Psychology*), written in the same year as *Studies on Hysteria* was published (Freud, 1895/2004), Mark Solms and others have tried to set out a prospective synthesis of psychoanalysis' insights into subjective human experience with the scientific rigour and materialist localisation techniques of contemporary neuroscience (Solms & Turnbull, 2002). Gilbert Rose has applied Solms' work and affective neuroscience to a psychoanalytic approach to music in his book *Between Couch and Piano* in an attempt to go beyond conceptions of listening as a form of passive reception (Rose, 2004). Breuer's argument that Anna O.'s nervous cough was triggered by music was unconscious but not impersonal or passive reminds us that not every model reduces unconscious reactions to purely biological terms. The best neuroscience of music combines a view of the undoubted embodied character of listening with a broader understanding of the ways in which it is also embedded in social, cultural and subjective contexts. In order to achieve this, historians and musicologists are in a good position to contribute to a critical historical neuroscience of music that clarifies the conceptual boundaries and potential of the field (Choudhary & Slaby, 2011).

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10

"WHAT IS THIS MUSIC DOING TO ME?"

Psychological Experiments on the Effects of Music on Mood in the First Half of the Twentieth Century

Marta García Quiñones

Introduction

In the Introduction to *The Effects of Music*, edited by Max Schoen (1927), Walter Van Dyke Bingham declared that the book was "a response to the inquiry which any thoughtful listener makes, 'What is this music doing to me?,'" and he presented it as "a challenge to science to explain more adequately than has as yet been done the nature and the mysteries of musical effects" (Bingham, 1927, p. 1). While this question could be located within the ancient and continuing tradition of reflection on the powers of music, it also adhered to what James Kennaway (2012) has called "the stimulation model of music's effects," a model that American psychologists such as Schoen and Bingham decidedly embraced during the first decades of the twentieth century and that lives on in current neuroscience of music (see chapters by Kennaway, Taruffi & Koelsch, and Eerola in this *Companion*). Recent books such as Levitin's *This is Your Brain on Music* (2006) that favour an image of the human mind as affected by, rather than actively engaged in, music could be interpreted as a continuation of the intellectual approach that *The Effects of Music* advocated.

Although the relevance and representative nature of the majority of the experiments reported in *The Effects of Music* may be questioned, the interest that most of its contributors showed in defining types of listeners and identifying prevalent moods places it at the transitional moment of American psychology toward statistical procedures (Danziger, 1987). As I will argue in the first part of this chapter, this trend emerged in the interwar years in applied and educational psychology and also influenced the psychology of music. At the same time, *The Effects of Music* illustrated how the phonograph could be used as a psychological instrument for the exploration of emotional mechanisms within the framework of contemporary theories of emotion. The collection was a result of the Edison-Carnegie Music Research programme, which Bingham was leading at the time with the assistance of Schoen and Esther L. Gatewood, both of whom authored several essays included in it. As I will explain in the second part of this chapter, the Edison-Carnegie Music Research programme was conceived as a promotional effort for the New Edison phonograph, an effort that also produced

the *Mood Music* (1921) pamphlet and the mood change charts, which advertised the phonograph almost as a therapeutic instrument. In the third part of this chapter I will focus on *The Effects of Music*, particularly on the essays included in sections two, "The sources of musical enjoyment," and three, "The mood effects of music," and more specifically on those contributed by Schoen and Gatewood, which were elaborated within the framework of the Edison-Carnegie Music Research, although – as I will argue – they occupy an ambiguous position in it. These papers dealt with the moods aroused or enhanced by different types of music, which the authors tried to classify according to several criteria, also in relationship to larger notions.

The Effects of Music or the Phonograph as a Psychological Instrument

The extent to which the experimental approach of *The Effects of Music* contrasted with traditional European (and especially German) notions of music listening as a spiritual activity and the associated aesthetic ideology can be deduced from the justification advanced by Bingham in the Introduction. Here he explained that the inquiry was not to be conducted "without the guiding insight of musician and aesthetician to furnish clues to help in evaluating the results," since the contributors, he claimed, were all competent or at least deeply interested in music (Bingham, 1927, p. 1). While the essays in the collection generally did not question but rather embraced prevalent notions about music listening and the hierarchy of musical taste, Bingham's introduction contained at least two novel elements that seemed to relate only to the method adopted by the various contributors, but that had deeper repercussions.

The first was the use of the phonograph as an aid to control "the stimulus," that is the music whose effects were tested experimentally. As Bingham argued, "the scientist prefers a problem with only one independent variable," though "it is hard to make all the variables in a musical experiment stay put." Thus, while he claimed that it was possible to control the external conditions under which the experiment took place, only the phonograph could guarantee "that successive presentations of a musical stimulus are practically identical." For this, he argued, "[m]usical science owes to Mr. Edison a great debt" (Bingham, 1927, p. 2). Indeed, the debt was quite literal considering that the majority of the essays in *The Effects of Music* were submitted in a competition conducted by the American Psychological Association in 1921, where the prize of USD $500 had been funded by the famous inventor through the Edison-Carnegie Music Research initiative. As Bingham declared in an announcement in *Science*, the competition aimed at selecting "[t]he most meritorious research on 'The Effects of Music'" produced during the academic year 1920–1921, since Edison and his associates wanted to understand the "affective and volitional" effects that "contrasted sorts of musical selections produce on listeners of differing native endowments and training, under varying conditions of mood, season and physical condition" (Bingham, 1920, p. 381). Thus, while the prize alluded generally to the "Effects of Music," its explicit aim was to investigate how "musical selections" (mostly on phonograph records) could affect various listeners under different situations. For that reason, the studies included in *The Effects of Music* dealt for the most part with the effects of musical selections in their entirety, instead of a series of tones or melodic fragments, which had principally been used in earlier musical experiments (Bingham, 1927, p. 7).

The second element concerned the other variable in musical experiments, that is, the listener. The implicit subject of the question "What is this music doing to me?" was clearly an individual (an "I") and Bingham evoked the problem posed by individual differences in responses to music, arguing that "the same selection often affects two people differently" and even the same person "can never experience a second time the precise sensations of a first hearing" (p. 3). However, he declared that the task of the psychologist was also to seek to "learn the normal typical response to various kinds of music" and, if possible, to formulate "the laws governing the variations from this norm" (p. 4). While this was in accordance with the reference to "the tools of statistical procedure"

that the author had introduced at the beginning of the text, it also posed the question of the "Effects of Music" in relationship to social types and populations, detaching it from the realm of the individual soul where it traditionally belonged. Although this must be interpreted in relationship to the market-research purposes of the Edison-Carnegie Music Research programme, it also points at larger movements in psychology and the psychology of music in the United States.

During the two first decades of the twentieth century, psychology was consolidated and institutionalised as a new experimental discipline, separate from philosophy. This process took place in the United States even more rapidly than in Germany, the place where the first psychological laboratories had been established and where the members of the first generation of American psychologists had studied (Ash, 2003, p. 257). Studies in audition and musical tones featured among the research interests that American psychologists adopted from their German mentors, and experimental practices with sounds were normally included in the introductory courses offered by the first psychology departments of American universities (Davis & Merzbach, 1975).

Far from being a mere continuation of European conceptions and practices, psychology adopted a special character in the United States, mainly under the influence of Darwin's theory of evolution and the statistical approach pioneered in England by Francis Galton and Roland Fisher (Green, 2009; Kwa, 2011, pp. 217–218). The discipline also took a marked turn toward "application," an ambiguous term that must be understood in a double sense. On the one hand, as Nikolas Rose has argued with reference to the institutionalisation of British psychology, the discipline and the profession were established "in all those fields where psychological expertise could be deployed in relation to problems of the abnormal functioning of individuals" (Rose, 1985, p. 3). On the other hand, psychology in the United States was "applied" in the sense that it oriented itself to the resolution of practical problems and this orientation was very much evident in the interwar period (Toulmin & Leary, 1985, pp. 598–599). As Kurt Danziger has observed (1987), in the second decade of the twentieth century a shift was noticeable in the research practices of American psychologists "from the *analysis* of psychological processes manifested in individual minds to the *distribution* of psychological characteristics in populations" (p. 16), that is, to statistical techniques. Thus, in the United States the administrative demands of the educational market, often modelled after the principles of scientific management, prompted many psychologists to focus their research on groups, comparative experimentation and the calculus of probabilities (pp. 18–19). Applied psychology, which catered to the needs of industry and commerce and flourished in the interwar years, adopted similar patterns of research (p. 25).

Both senses of "applied psychology" were represented in psychological research into audition and music perception in the United States during the first decades of the twentieth century, when scholars developed new theoretical approaches, experiments and instruments in response to the urgent need to extend musical instruction in the public school system and to identify talented students who could become professional musicians. This purpose guided the careers of scholars like Carl Seashore, who is widely regarded as a pioneer of music psychology and who devoted a lot of attention to music education, especially to the experimental evaluation and development of musical ability (Deutsch, Gabrielsson & Sloboda, 2001; Miles, 1956). He created what are considered to be the first standardised tests to measure musical "talent": the *Seashore Measures of Musical Talent*, first published in 1919 and updated in 1939, 1956 and 1960 (Seashore, 1919a; Seashore, Lewis & Saetveit, 1939, 1956). Seashore identified "musical talent" with "the musical mind," which for him also included musical action, imagery, memory, intellect and feelings; he admitted that "musical talent" was just one aspect of the psychology of music, which also encompassed the psychology of art principles involved in music and the psychology of musical training (Seashore, 1919b, p. 1). However, the Seashore tests only evaluated the perception of specific aspects of music, such as pitch, loudness, duration, consonance, tonal memory and rhythm, through series of tones produced firstly by a tuning fork and later by an electric beat-frequency oscillator. The tones were published initially

as 78-rpm records by the Columbia Graphophone Company and in 1939 by the RCA Manufacturing Company (Gordon, 2006, p. 51). The use of the phonograph to standardise musical stimuli was one of the innovative aspects of Seashore's tests. Thus, in the introductory pages to the *Manual of Instructions and Interpretations* that accompanied the first edition of the *Seashore Measures* the author praised "the extraordinary accuracy of the modern phonograph motor," which allowed for the exact repetition of each series (Seashore, 1919a, p. 2). While Seashore suggested that the tests could furnish also material for scientific entertainment in the home, they were primarily meant for teaching and educational purposes – more generally, the educational perspective prevailed in his work and he tended to consider music receivers as potential producers (Malin, 2011, p. 310; Seashore, 1919a, pp. 3–4). In contrast, the Edison-Carnegie Music Research initiative represented a much clearer attempt to apply rudimentary statistical methods to the comprehension of music consumption. *The Effects of Music* demonstrates how much strain this put on traditional notions of music listening and the centrality of aesthetic taste.

A third element was, however, absent from Bingham's Introduction, though it featured prominently in *The Effects of Music* under the concepts of mood, feeling and emotion or more specifically, pleasantness, enjoyment and the whole catalogue of emotional states accompanying music (see Washburn & Dickinson, 1927, pp. 127–129). Far from being settled, the definition of emotion and especially the relationship between physiological and subjective aspects in emotional experiences was very much under discussion at the time. The discussion had been ignited by the publication of William James's influential paper on the subject (which contained what would later be known as the James-Lange theory of emotion) and its critical reconsideration by Walter Cannon, who developed the Cannon-Bard theory of emotion (Cannon, 1927; James, 1884). James argued that the mental states associated with emotions did not cause the bodily changes that followed them (i.e., visceral reactions and reactions of the autonomous nervous system), but on the contrary, emotions were the feeling of those bodily changes as they occurred, after the perception of the fact that caused the emotion (James, 1884, pp. 189–190). Cannon, with his student Philip Bard, re-examined James's claims, observing the role of the brain in emotions and they concluded that emotional mental states and bodily changes were relatively independent, the former adding to the latter when the simple sensation of the emotional fact was processed by the brain (Cannon, 1927, p. 120; Friedman, 2010).

More important than differences between contemporary theories of emotions was the fact that James's mechanistic view represented the emergence of a new model of emotional experience, where the body as an emotional site gained attention and the focus moved from the subjective will to external mechanisms of control (Dror, 1998, pp. 174–175; Morawski, 1997, pp. 226–227). This new model created tensions both in academic and popular psychological discourses between conceptions of the free, modern subject and biomechanical explanations, which considered emotional experiences as mere reactions or even by-products of bodily states (Morawski, 1997, p. 218). Within this materialistic framework, the phonograph appeared as an instrument able to create particular effects on listeners' bodies and minds, not only motor and cardio-vascular reactions, but also feelings of happiness or irritation (and everything in between) – all of which could be located in the spectrum of emotions.

Schoen, Bingham and the Edison-Carnegie Music Research

The editor of *The Effects of Music*, Austrian-born music educator Max Schoen (1888–1959) completed a PhD in music psychology with Seashore in 1921. After that he accepted a position at the Carnegie Institute of Technology, where he became head of the Department of Education and Psychology in 1925 and where he would remain until his retirement in 1947. Although he shared Seashore's views about the importance of experimental research and the need for a scientific methodology in

music education, in his psychological studies he was scarcely concerned with representativeness or experimental controls and he seemed to favour philosophical and aesthetic reflections, which in his view did not conflict with experimentalism (Lee, 1997, pp. 88–91). Thus, one year after editing the psychological collection *The Effects of Music*, he authored *The Beautiful in Music*, a title obviously inspired by Eduard Hanslick, in which he reflected on "the varieties of experiences and effects derived from music" in order "to establish their relative values as aesthetic attitudes toward music" (1928a, p. xi). In 1948 he edited with Dorothy M. Schullian the seminal collection *Music and Medicine*, which traced the history of the subject and is considered today as a classic of music therapy studies (Gouk, 2000; Schullian & Schoen, 1948).

Schoen was invited to join the Carnegie Institute of Technology by Walter Van Dyke Bingham (1880–1952), who served as director of the Division of Applied Psychology (Bingham, 1923, p. 158; Schoen, 1947, p. 5). A student both of James Angell and Hugo Münsterberg, Bingham had showed an early interest in the psychology of music, authoring a book titled *Studies in Melody*, where he discussed an experiment that consisted in recording the tapping movement of fingers along a series of tones produced by a reed organ (Bingham, 1910, pp. 43–80; Gjerdingen, 2002, p. 962). Combining the results of this experiment with the introspective reports of the experimental subjects, Bingham aimed at understanding whether they could perceive the completeness (that is, the melodic unity) of the series. He found some degree of correlation between motor activity (muscular tension and relaxation) and the experience of melody, and he concluded that the experience of melody resulted not only from sensory elements (the phenomenon of consonance), but also from association or habituation effects on the listeners' minds (Bingham, 1910, pp. 87–88; Hui, 2012, pp. 604–606; Selfridge-Field, 1997, pp. 292–294). During his years at the Carnegie Institute, Bingham was mainly known as an advocate of applied and industrial psychology. Around the beginning of 1920, Bingham started a collaboration with the Phonograph Division of Thomas A. Edison, Inc., to study the effects of (recorded) music, providing the company with valuable information about the appeal of the records in their catalogue (Grajeda, 2013, p. 31; Hui, 2014, p. 140; Selfridge-Field, 1997, p. 295). Using equipment and assistants supplied by the company, Bingham and his team "classified six hundred selections according to their observed effects on mood" and "carried through a number of experiments on the influence of different types of selection on efficiency in practical activities" (Bingham, 1923, p. 156).

The Edison Company had started by selling only cylinders, but it launched their first discs in 1912. The Edison Diamond Discs were marketed as "Re-creations" and the New Edison Diamond Disc phonograph was conceived and presented as a musical instrument. In 1915 the company initiated a tone test campaign to demonstrate the sound quality of their Diamond Discs by comparing them to living performances (Morton, 2000, pp. 22–23). While audiences engaged with these marketing events and the tests enabled them to transform their conception of what constituted "real music" to include phonographic reproductions, turning them into experts on sound fidelity, the focus of the campaign was not on responses to the music (Hui, 2012, p. 611; Thompson, 1995, p. 160). By the early 1920s, when Edison decided to fund the Carnegie Research programme on the effects of music, the Edison Company was still selling cylinders along with discs and it had only a small share of the US market, which was dominated by the Columbia Phonograph Company and the Victor Talking Machine Company. The Edison-Carnegie Music Research programme was short-lived. During the two years in which it ran, Edison was often sceptical about its results and its effectiveness as a marketing tool and he decided to terminate its activities in February 1922. Also, within a few years the much-advertised excellence of Edison's acoustic records would be surpassed by the sound of electrical recording, introduced in 1925. However, the Edison Company would be the last one to adopt the electrical recording technology: it made the first electrical recordings in 1927 and stopped the production of phonographs and recordings in 1929 (Dearling, Dearling & Rust, 1984, p. 36).

Nevertheless, in 1919 an advertising booklet *Edison and Music* still insisted on the superior quality of the New Edison phonograph, whose "reproduction of music cannot be detected from the original music" and referred to various press reports on the successful tone test campaign. Extensively illustrated with drawings of period furniture cabinets to be used as phonograph cases, the booklet also comprised a text insert on "The musical ideals of Thomas A. Edison," where the inventor praised music and rejoiced that the phonograph could bring the uplifting power of music to everybody, since even those who were not gifted to compose music, sing or make music, "love to listen to it in times of mental stress" (*Edison and Music*, 1919, pp. 3, 13, 19). The pamphlet presented two key elements that would also be fundamental to the Edison-Carnegie Music Research programme: the functionality of music to elicit, enhance or change moods, and the home as the setting where the phonograph could be used as an almost therapeutic instrument to serve the needs of individual family members. Both elements were also present in another promotional pamphlet published by Thomas A. Edison, Inc. in 1921, entitled *Mood Music* (on the availability of the pamphlet see Grajeda, 2013, p. 33, n. 4; Hui, 2014; Selfridge-Field, 1997, p. 309, n. 28).[1]

A product of the Edison-Carnegie Music Research programme, *Mood Music* (1921) was, as its subtitle suggested, *A compilation of 112 Edison Recreations according to 'what they will do for you.'* These were based on psychological experiments conducted under the direction of Bingham, though it is not clear whether he should be credited as the author (Grajeda, 2013; Hui, 2012, 2014; Selfridge-Field, 1997). After a Foreword and a text entitled "Mood music," readers found the 112 Edison records or "Re-creations" classified into 12 listings, whose titles alluded to the moods that they were supposed to induce: "To stimulate and enrich your imagination;" "To bring you peace of mind;" "To make you joyous;" "In moods of wistfulness;" "Jolly moods and good fellowship;" "For more energy!;" "Love – and its mood;" "Moods of dignity and grandeur;" "The mood for tender memory;" "Devotion is also a mood;" "Stirring;" and – as a last, non mood-related category – "For the children." The pamphlet also included a text signed by Bingham, "Research on moods and music" (*Mood Music*, 1921, pp. 28–31), as well as a special form called a "mood change chart" filled out by private detective William J. Burns and introduced by a text inviting listeners to register their reactions to music.

As the Foreword emphatically announced, *Mood Music* treated music "from an entirely new viewpoint – the viewpoint of *what it will do for you*," replacing old genre categories that were commonly used by phonograph companies (such as "Operatic gems" or "Band music") with the evocative titles mentioned above. The text entitled "Mood music" opened with some remarks about the physical effects of music and about the fact that it was generally regarded "merely as a means to pleasure," whereas it "might be utilised to do you much practical good" (p. 5). Mixing references to ancient and contemporary authors, from Confucius to Emerson, the text presented music as a kind of soothing or stimulating medicine, asking readers "why not 'take' music every day, for our mental well-being, just as we take food for our physical well-being?." The addressees of this call were millions of people, described as suffering from a variety of psychical ailments including loneliness, exhaustion, the nervousness caused by modern life, business worries or discouragement (p. 6).

Six illustrations distributed across the booklet represented mostly middle-class men and women who, before playing recorded musical selections, were under "the tense strain of business," worried by "a bad jolt in the market," "nervous and exhausted from shopping," "too tired to eat," "lonesome" or "too tired to get dinner," as the captions claimed and afterwards were "soothed and refreshed by music," "steadied by music," etc., their sufferings having been alleviated by listening to the "right" music. These illustrations thus offer examples of how the tensions between images of the modern subject and the mechanistic model of emotions were articulated, with different types of "mood music" being presented as useful tools to manage the stress of everyday life. In other words, the drawings show how music could have a beneficial effect on modern citizens and more specifically, on their nervous bodies. As Hui has remarked, "the phonograph allowed the listener

to take individual action to cause a bodily effect with scientific precision" and this bodily effect also affected his or her mood, according to a mechanistic model of the emotions (Hui, 2014, pp. 141–142). The phonograph, then, empowered those modern subjects, since it gave them the means to alter their bodies and minds and thus to exert the kind of "cool" emotional restraint that emerged in the 1920s according to scholars such as Stearns (1994).

Even though the text *Mood Music* offered a brief description of how research had been conducted and how the 12 music listings were elaborated, for methodological detail the readers were referred to the closing text of the booklet. There, after some considerations about how music could help people at work and at leisure and how it could influence different psychological aspects, Bingham explained how they had gone about specifying what selections should be played to get a desired effect using solely the tool of introspection or "looking into one's self." Toward this end, the psychologists engaged three listeners (two women and one man), whom they considered as "experts in introspection," two of whom were musicians, while the third was deemed a typical music lover with "a keen ear for what is good." These three subjects listened to 589 selections including "every kind of vocal and instrumental selection, popular and classical, brilliant and subdued, simple and elaborate" (Bingham, 1921, p. 29). From their reports the selections were split into three groups: one whose effects were marked, but which varied with every listener, a second group of selections that produced little or no effect and a third group that not only produced marked effects, but each selection affected each listener in substantially the same way. This latter group consisted of the 135 selections that were eventually divided into the 12 categories of music described above. Bingham argued that besides the music, the temperament of the listener was "the most potent factor" in explaining how he or she reacted to the music, but he also acknowledged that their studies left out a great number of "complicating factors." Nevertheless, he still insisted that the experiment could predict "the normal, typical response which an individual should make to various types of music" (p. 30).

Compared to the experiment described by Bingham, the mood change chart that appeared at the end of the booklet represented an attempt to bring the research to a new level, launching a survey to collect consumers' reports on the mood effects of the Edison Re-creations. In fact, the same year *Mood Music* was published the Edison Company had embarked on another survey to gain understanding of the musical tastes and opinions of phonograph users. The questionnaire, which was mailed to thousands of them, was signed by Thomas A. Edison in person and asked phonograph owners to list their favourite tunes and explain why they liked them (Taylor, Katz & Grajeda, 2012, pp. 56–57). The aim was to gather information about the kind of music that listeners would like to buy, though the more than 2,000 survey returns that are still preserved today offer information that goes beyond musical preferences, tracing a complex image of the way that users employed their phonographs and related to their musical selections (Kenney, 1999, pp. 5–14; Taylor, Katz & Grajeda, 2012, pp. 57–65).

Designed by William Maxwell, President of the Phonograph Division of the Edison Company and approved by Bingham, the mood change chart was a more structured form and required more effort on the part of users. At the centre of the chart there was a space for listeners to report the mood changes they had experienced after listening to different Edison Re-creations and a blank space was left at the bottom for listeners to comment freely on how these mood changes happened. In this way the Edison Company invited readers of the *Mood Music* pamphlet to observe music's effects on themselves or their friends and advised them that the charts could be used not only in psychological experiments, but also as entertainment for families or as a basis for organising "mood change parties" (*Mood Music*, 1921, p. 32). An advertising campaign was launched to encourage consumer participation in mood change tests, which they could take at local dealers if they did not own an Edison phonograph (Selfridge-Field, 1997, p. 298). Indeed, hundreds of mood change parties were held in different locations, including university campuses such as Yale, Harvard and Columbia (Grajeda, 2013, pp. 45-47; Hui, 2012, pp. 611–613).

Research into the Impact of Music on Mood in *The Effects of Music*

A belated result of the Edison-Carnegie Music Research programme, *The Effects of Music* (1927) included essays that had been submitted to the Thomas A. Edison Prize, plus three reprints.[2] Yet, published six years after the Edison Prize announcement and more than four after the end of the Carnegie research initiative, a point when Bingham had already left his position at the Carnegie Institute, *The Effects of Music* obscured the commercial and marketing purposes that had inspired the project, underlining instead its scientific character. Whereas *Mood Music* provided scientific arguments for selling the New Edison phonograph using promotional language, the collection edited by Schoen presented itself as an exploration of the impact of music, where the phonograph was employed as a reliable psychological instrument to explore that impact, although possible differences between listening to live music and listening to records, for instance the "personal element" in concert programmes, were not addressed (Gatewood, 1927a, p. 80). Besides, as a volume in the influential series "The international library of psychology, philosophy and scientific method," published between 1922 and 1956, *The Effects of Music* was an academically prestigious way to develop the questions addressed by the Edison-Carnegie Music Research and it succeeded in creating a debate on those issues by engaging well-known authors that were outside the original project.

In general, *The Effects of Music* dealt with the subjects that the organising committee had suggested to scholars who wanted to submit their essays to the Edison Prize (Bingham, 1920, p. 381). Section one included a chapter dealing with individual differences in listening to music by British psychologist Charles S. Myers (1873–1946) and one by American music educator Otto Ortman (1889–1979) on types of listeners (Myers, 1927; Ortman, 1927a). Sections two and three constituted the thematic core of the collection, in which such important subjects as the "classification of musical selections according to their musical effects" and the "modification of moods by music" were elaborated. In particular, section two included a long piece by Gatewood, "An experimental study of the nature of musical enjoyment," which was distributed across chapters 4 and 5 (Gatewood, 1927a, 1927b) and the essay that won the prize, "The sources and nature of the affective reaction to instrumental music" signed by American psychologist Margaret F. Washburn (1871–1939) with George L. Dickinson (Schoen, 1928b; Washburn & Dickinson, 1927).[3] Section three included two chapters by Schoen and Gatewood about the mood effects of music (Schoen & Gatewood, 1927a, 1927b).

Even if physiological effects were commonly invoked in scientific explanations of the "powers of music," in the collection the emotional effects of music were granted much more attention than its strictly physiological effects. The questions of "muscular activity" and "objective (physiological) measurements" were the main focus of only two chapters. The first, chapter 9, was entitled "Effects of music upon electro-cardiograms and blood pressure" by American physiologist Ida H. Hyde (1857–1945) and constituted section four, on "The organic effects of music." In this chapter Hyde reported some experiments into cardio-vascular functions and found that these were "reflexly stimulated concomitantly with psychological effects of music," where "concomitantly" suggests a position closer to the Cannon-Bard theory of emotions than to James-Lange (Hyde, 1927, p. 195). The other chapter was "The immediate and long-time effects of classical and popular phonograph selections" by American psychologists A. R. Gilliland (1887–1952) and H. T. Moore, which also included measurements of muscular activity and a photographic comparison of the facial expression and bodily posture of subjects listening to familiar or unfamiliar selections of classical music or jazz (Gilliland & Moore, 1927, pp. 214–217). Whereas the authors admitted that the photographs revealed only subtle differences in attitude, they perceived a "slightly puzzled, uncomprehending expression" in the subjects listening to unfamiliar music (see Figure 10.1a & 10.1b), compared to the "greater directness of gaze" of the same subjects listening to music they knew (p. 219).

Gilliland and Moore's chapter, together with chapter 10 on "The effects of immediate repetition on the pleasantness or unpleasantness of music" (Washburn, Child & Abel, 1927) and chapter 12,

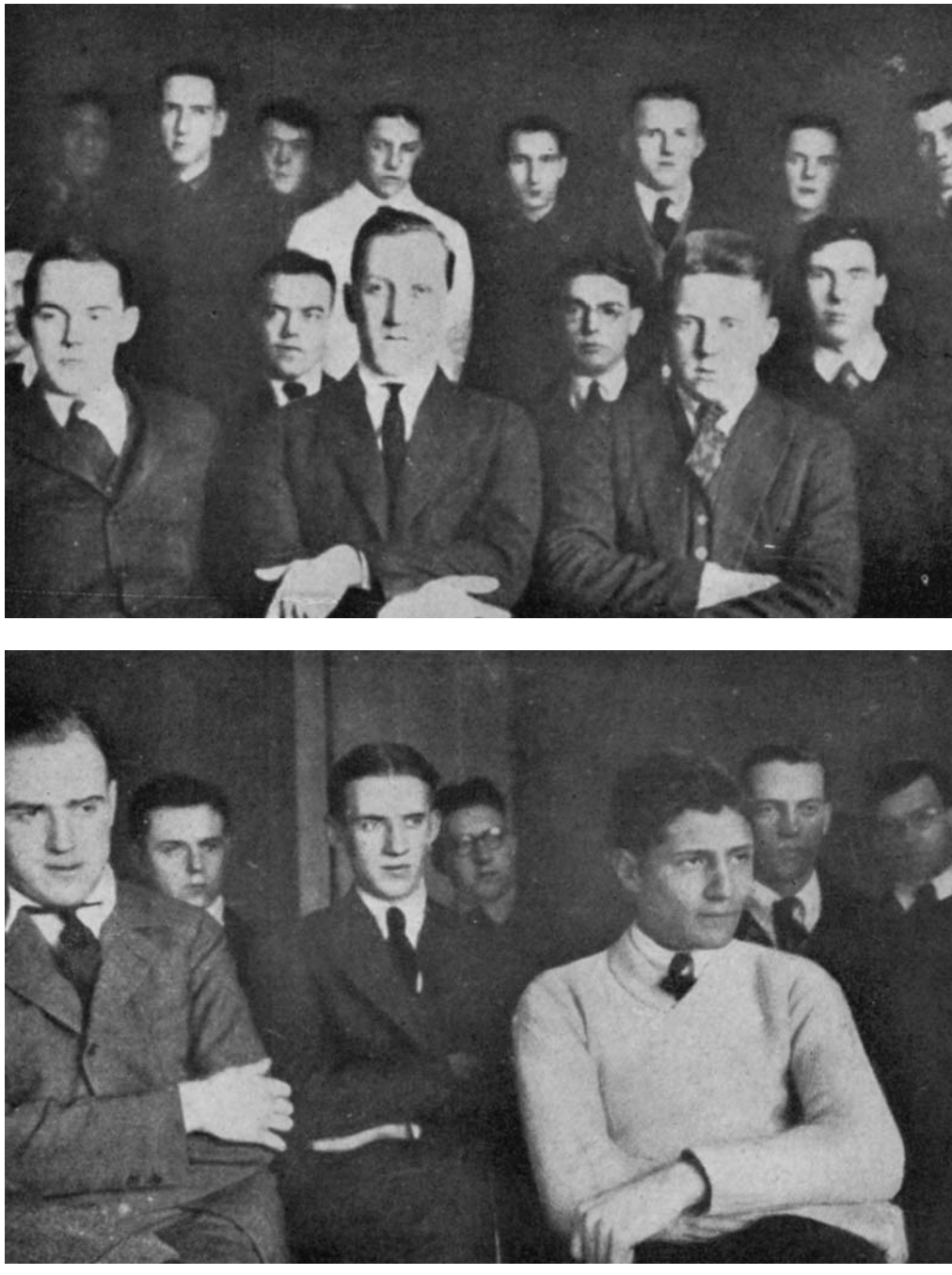

Figure 10.1a and b "Showing Facial Expressions of Subjects while Listening to Unfamiliar Classical Music"
Source: *The Effects of Music* (Gilliland & Moore, 1927, *face* p. 216). The photographer is unknown

"The effect on a musical programme of familiarity and a sequence of selections" by American psychologists June E. Downey (1875–1932) and George E. Knapp (1927) constituted section five, titled "The effects of repetition and familiarity," which can be seen as a development of the subject of habituation effects that Bingham had tackled in his research into the unity of melody (Bingham, 1910). While the notions of repetition and familiarity were not alien to the culture of classical music concerts and the music appreciation movement that was developing at the time, they were also closely associated with phonographic culture, since as Gilliland and Moore stressed, "repetition is the inevitable rule with everything pertaining to the phonograph" (1927, p. 219). Besides, the analysis of sequences of musical selections, which Downey and Knapp related to the planning of music programmes for artistic purposes or for musical appreciation courses could also be associated with the short duration of phonographic records at the time (Downey & Knapp, 1927, p. 230). The chapters included in section five thus treated subjects that might be considered as effects of the phonograph on musical experiences, rather than just effects of music. Finally, section six tackled a subject not included in the original list, namely the effects of music on the other senses (Ortman, 1927b). In that section, Gatewood's chapter on linguistic similes for describing music effects had further implications, since it concluded that "no auditory vocabulary, universally understood" could describe musical experiences (Gatewood, 1927c, p. 267).

In particular, the essays included in sections two and three offered invaluable examples of the kind of studies fostered by the Edison-Carnegie Music Research programme, and they must be considered in relationship to the notions elaborated in the *Mood Music* pamphlet of 1921, since they developed similar questions. One striking thing is that none of the contributors felt the need to define such important terms as "emotion" or "mood." Thus, in chapter 4 Gatewood stated that "the term *emotion* is used throughout this paper very broadly and loosely to cover any affective experience" (1927a, p. 79) and in chapter 6 a footnote by Washburn and Dickinson reported practically the same (1927, p. 127). In contrast to the 1921 pamphlet, which demonstrated the emotional effects that recorded musical selections could have on ordinary people, the majority of the essays included in sections two, three and five reported experiments conducted on university students, who often had some degree of musical expertise (Gilliland & Moore, 1927, p. 220; Schoen & Gatewood, 1927a, pp. 137–144; Washburn, Child & Abel, 1927, p. 202; Washburn & Dickinson, 1927, p. 121). It would probably be a mistake to assume that the mechanistic model of the emotions was implicit in all essays that were included in these sections, since subjects' bodies were significantly left out of consideration and authors did not comment on their physical or emotional condition.

In line with this, the majority of the experiments were based on introspection, that is on reports or statements written by experimental subjects, who sometimes were asked to fill out charts similar to the ones designed for the mood change tests. Results were often elaborated in tables using elementary tools of statistical analysis, though the populations considered were normally very small, due to concern with the correctness of experimental procedures. In that respect, Schoen and Gatewood's chapter, opening section three, which referred to the mood change chart survey launched within the framework of the Edison-Carnegie Music Research, is exemplary. After ordering the information obtained from more than 20,000 mood change charts, where users "reported the effects produced upon their moods by a variety of 290 phonograph recordings of vocal and instrumental musical compositions," the authors came to the conclusion that a musical composition was not only able to produce changes in affective states, but "that its effect upon the large majority of the members of an audience is uniform to a striking degree" (Schoen & Gatewood, 1927a, p. 131). However, they objected to the conditions under which the information was gathered, which they found "entirely out of keeping with established experimental procedure" and proposed instead a test involving only 17 male and female students at Carnegie Institute of Technology, whose musical backgrounds, training and tastes were also considered (p. 137). The chapter thus privileged the possibility of controlling experimental conditions and having a better

knowledge of experimental subjects over the statistical validity of the results. Even if the reported experiments were presented as an inquiry into the validity of the introspective approach to study the effects of music, their results would hardly be representative by modern standards.

The Effects of Music, and especially the two sections dealing with emotional effects, emphasised a systematic classification of mood effects. Thus, Gatewood distinguished between "the general effect of pleasantness or enjoyment" and particular feelings or "emotional effects," such as rest, sadness, joy, love, longing, amusement, dignity, stirring or reverence (Gatewood, 1927a, pp. 87–91), on which enjoyment apparently depended. Washburn and Dickinson made a similar distinction between such general notions as "pleasantness" (or unpleasantness) and "the exciting and quieting effects of music," which they tried to relate to musical elements through introspective experiments (Washburn & Dickinson, 1927, p. 121) and the various emotions accompanying music, which they classified according to those general notions (pp. 128–129). These distinctions made possible nuanced observations of music effects, like the acknowledgement that "mild unpleasantness" might be compatible with aesthetic enjoyment, and they might be considered as a contribution to empirical aesthetics, in which pleasure and displeasure would substitute for aesthetic value (p. 129).

Conclusions

The Effects of Music can be interpreted as a showcase for the tensions between the ideology of music aesthetics and the new physiological and psychological models that tried to explain how music could act on the body, the mind and the emotions. At the centre of those tensions, the phonograph, a musical and a psychological instrument, played a key role in the definition of new models, since it created not only the possibility for large-scale experimentation, but also new listening conditions (Hui, 2012). On the one hand, many contributors to *The Effects of Music* apparently assumed that exploring the effects of recorded musical selections was just a more scientific, objective way to explore (live) music effects, and some chapters (Schoen & Gatewood, 1927a) exemplified the resistance that new market research procedures (such as the mood change charts) encountered among music scholars. On the other hand, the exploration of the notions of repetition and familiarity bore witness to an emerging interest in the phonographic experience of music (Downey & Knapp, 1927; Gilliland & Moore, 1927; Washburn, Child & Abel, 1927). The collection thus took an important step toward an experimentally-based conception of musical aesthetics, which would be focused mainly on the effects of music and not on the logics of musical composition (Schoen & Gatewood, 1927a, 1927b). It also offered a catalogue of experimental procedures to measure and classify those effects even though the extent to which individual introspective reports could serve this purpose remained an open question.

Notes

1 I would like to thank Kathy M., of the Benson Ford Research Center, for sending me a scanned copy of the *Mood Music* pamphlet.

2 This was the case with chapter 2 (Myers, 1927), which had originally been published by the *British Journal of Psychology* in 1922, with chapter 9 (Hyde, 1927) originally published in the *Journal of Experimental Psychology* in 1924 and with chapter 11 (Gilliland & Moore, 1927), which appeared in the *Journal of Applied Psychology* during the same year.

3 However, Bingham had stated in the Introduction to *The Effects of Music* (1927, p. 5) that the jury – consisting of himself, Professor H. P. Weld at Cornell University and Professor H. D. Kitson at Columbia University – had awarded the prize to the essay "The effect of immediate repetition on the pleasantness or unpleasantness of music" by Margaret F. Washburn and her collaborators, which was published as chapter 10 of the book (Washburn, Child & Abel, 1927). Since Schoen's correction (1928b) appeared the following year, I take it as the final word on the matter.

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11

MUSIC, BODY AND EMOTION BETWEEN WELL-BEING, MANIPULATION AND TORTURE IN THE TWENTIETH CENTURY

Juliane Brauer

Introduction: Music in "Life's Tumultuous Round"

In 1817, Franz Schubert composed his lied *An die Musik* (*To Music*). Based on a poem by the Romantic poet Franz Schober, it became one of the composer's most famous songs. The text of this declaration of love to music reads as follows:

1. Du holde Kunst, in wieviel grauen Stunden	Beloved art, in how many a bleak hour,
Wo mich des Lebens wilder Kreis umstrickt,	When I am enmeshed in life's tumultuous round,
hast Du mein Herz zu warmer Lieb entzunden,	Have you kindled my heart to the warmth of love,
hast mich in eine beßre Welt entrückt.	And borne me away to a better world!
2. Oft hat ein Seufzer, deiner Harf entflossen	Often a sigh, escaping from your harp,
Ein süsser, heiliger Akkord von dir	A sweet, celestial chord
Den Himmel bessrer Zeiten mir erschlossen	Has revealed to me a heaven of happier times.
Du holde Kunst, ich danke dir dafür!	Beloved art, for this I thank you!
	(translation in Mak, 2006, p. 292)

This Romantic, early nineteenth-century perspective viewed music as the good Muse, the Muse that had the power to exert a positive effect on human feeling, thinking and action, which was and is a matter of consensus among various disciplines. But music's power is not to be found in the music alone. Rather, it unfolds in concrete practices and contexts, not all of which are as transfiguring as Schubert's song suggests.

Insights into the divergent impact of music is not new, but up until about ten years ago, the darker side of music's effects had gone largely ignored. Since then, a number of publications have

appeared that deal with the connection between music and torture. There have been studies on the use of music in American crime prevention and in the Iraq War, on violence as an essential part of popular music and on music as an instrument of torture in American prison camps like Guantánamo (Cusick, 2008; Hirsch, 2012; Johnson & Cloonan, 2008; Pieslak, 2009).

Based on new methods developed by scholars working with the "history of emotions," this chapter shows that the emotional impact of music lies not in its structure, but in its social usage. This demands that we focus not only on practices of singing, but also on historical, contemporaneous concepts of the emotional power of music in order to ask how and with which goals these concepts were transformed in actual practices. To this end, the chapter takes up three examples from twentieth-century German history in order to highlight situations in which music served as a form of comfort, a tool of manipulation and a means of violence.

Any discussion of the divergent impact of music will necessarily have to focus on the interplay between music itself, human emotions and the physical body. In this chapter, I seek to clarify the ways in which music can have various and even contradictory meanings in specific historical situations and I will reveal why music was chosen in these contexts in order to achieve these particular effects. The first part lays out the chapter's theoretical foundations by analysing the connection between music, emotion, mind, body and memory. On this basis, it defines collective singing, a specific form of making music, as an emotional practice.

The second part of the article consists of three historical analyses. The first examines how the celebration of "Sedan Day" in Berlin on 2 September 1914 regulated emotions and employed them toward creating a sense of community. The second takes us to the concentration camp Sachsenhausen where music was used as a form of torture. The third discusses how the collective singing of songs new and old was used to win over young people to the idea of a socialist society in the Soviet Occupation Zone after the Second World War. All three attempt to locate and define the emotional potency of music while analysing how this potency was used in historical situations to influence people's feelings, thoughts and actions.

These examples were deliberately chosen to go beyond the common view of music as a straightforwardly positive phenomenon that is only associated with pleasant emotions. Examples can be found in all periods. Nevertheless, as an "age of extremes," violence and dictatorships, it comes as no surprise that the twentieth century bore forth many uses of music as a tool of violence and manipulation (Hobsbawn, 1994). Still, for every example described here, there were situations in which music manifested its positive power. The chapter's intention is not to deny this fact, but simply to show the diverse roles music can play in "life's tumultuous round."

Music, Body and Emotion: Collective Singing as an Emotional Practice

What exactly makes music emotionally powerful? How can emotional reactions to music be explained? What precise effect does music have on the constitution of emotions? These are not new questions and defining what emotions are is itself a difficult project. But mapping out the relationship between music and emotions is even more challenging and has been the subject of an array of studies over the past 10 years. Scholars working in the humanities describe this connection in various ways. This is not entirely surprising, given the number of different principles and concepts on which their work draws (Cochrane, Fantini & Scherer, 2013; Juslin & Sloboda, 2010). Neuroscientists and psychologists of music have demonstrated that there is a close link between music and emotion. There seems to be a consensus that music directly affects the brain and the autonomic nervous system (Lindenberger, Li, Gruber & Müller, 2009; see also Fancourt in this *Companion*). By quantifying these reactions, music psychology seeks to ascribe certain emotions to things like rhythm, dynamics and key (Juslin, 2009, p. 382). Nevertheless, psychologists tend to leave out problems like individual listening practices, musical socialisation, preferences and dislikes, memories

and other aspects of musical practice that contribute to the construction of identity. A cultural history perspective reveals such approaches to be ahistorical; thus, they tell us little about how people in past times perceived music. For these reasons, I have opted for an approach that draws on the history of emotions and cultural anthropology to help explain the emotional effect of music in the past.

The history of emotions is a very new field of research, even if the question about the source and effect of emotions, feelings and affects is a very old one. Conceptions of and methods for researching emotions differ widely between the cultural sciences and neurology and psychology (Boddice, 2018; Plamper, 2015). Contrary to the view widely held among psychologists of music, the approach taken here argues that music has no universal meaning. Rather, it acquires meaning through the concrete situations in which it is performed. This process is dependent on multiple factors, including individual experiences, perceptions and the needs of listeners and performers (Hesmondhalgh, 2008, p. 329). With the help of music, emotions can be managed. Emotions' power derives from the fact that they are a central dimension of a person's experience and perception of the world, a dimension that is embedded in individual and shared knowledge, manners and attitudes.

Placing our focus on the body will enable us better to understand and explain how people perceive music and how experiences, emotions and performances contribute to perception. Monique Scheer defines emotions as practices of the "mindful body": "The body is actor and instrument. It is not conceived of as an assembly of organic material and processes alone, but as a knowing body, one that stores information from past experiences and contributes to human activity and consciousness" (Scheer, 2012, pp. 200–201). Or, in Greg Corness's pithy formulation: music is "embodied experience" (Corness, 2008, p. 21). Depending on one's cultural socialisation, music can be an important resource and medium for processing one's experiences and mediating one's perception through emotions. In the same way, music can be a means through which emotions themselves are produced, modulated and acted out. We can therefore say that music supports "emotion work" (DeNora, 2000, p. 57).

To conceptualise the relation between music, emotion management and memory, we might refer to the space in which music and emotions come together as a "contact zone" between inside and outside, the self (or the mindful body) and society. Firstly the mindful body, secondly the concrete conditions of performance and thirdly the musical material (composition) constitute the three pillars of this *contact zone* that is musical perception. In this model, music acquires its meaning within the triangular contact zone and the mindful body learns to attribute certain music with certain emotions. Because music connects emotions, identity and memory, listening to music is at once an act of cultural self-confirmation and identity construction. In this sense, we might say that the contact zone is the site where "emotion work" takes place. Moreover, performing emotions through the medium of music allows listeners and performers to ascribe new emotions to perceived music (see also Thormählen in this *Companion*). This conception of experiencing music fits well with the methodological approach of emotion as kind of practice (Scheer, 2012, p. 195). As such, Scheer conceives of doing emotions as a practice that is both inscribed into the body and acted out through it, describing it as a "bodily act of experience and expression" (Scheer, 2012, p. 209). This perspective seems particularly well-suited for analysing collective singing, which might also be seen as an emotional practice. In contrast to listening to music, singing is a more intense form of grappling with memories and emotions, because as a form of emotion management it involves the body in a much more active fashion.

The concept of singing as an emotional practice used in the following analysis, then, enables the singers to reactivate, communicate and regulate feelings. On the one hand, it serves to strengthen conceptions of self through the evocation of memories (see also Hara & DeNora's chapter and Hallam's chapter in this *Companion*). The concept of the contact zone makes clear how dynamic

and fluctuating the relation between memory and music is and helps demonstrate how this connection can be bolstered through repetition. On the other hand, viewing singing as an emotional practice emphasises the fact that emotions were and are, learned. In this sense, collective singing is a form of collective emotion work.

The meaning of songs changes depending on societal ascriptions and contexts, cultural interpretations and practices. That is the basic assumption of this chapter. Songs do not have an inherent emotional effectiveness, even if their composers may have intended it. Their effect resides with their usage, their performance and their perception.

Sedan Day, Berlin, 2 September 1914

In Berlin, 2 September 1914 was an especially hot day and not only because of the sun. A month after Germany had declared war on Russia, thus beginning the First World War, Berlin celebrated the 44th Sedan Day. One of the most important national holidays in the German calendar, Sedan Day memorialised the French army's capitulation at Sedan on 2 September 1870. Sedan Day 1914 turned out to be a special one as it was the first time since 1870–1871 that Germany was at war against, among others, its "archenemy" France. The first weeks of war went well for the Germans, who scored a number of victories in both the East and the West. Sedan Day 1914 thus became the "first commemoration day of the World War" ("Siegesbeute in Berlin," 1914). According to the *Berliner Volkszeitung*, an anticipatory victory parade along Berlin's central streets promised a display of artillery seized from the Russians, French and Belgians ("Siegeszug der Geschütze durch Berlins Mitte," 1914), attracting a "rush of spectators" that began in the early morning hours ("Sedanfeier in Berlin," 1914, p. 1). Large groups of Berliners waited in suspense for the parade. Captured by the mood, a reporter described the parade approaching Brandenburg Gate "with even steps, with flags and music," writing that "having been held back since the early morning, cheers erupted. The grenadiers played *Lieb Vaterland, magst* . . . [*The Watch on the Rhine*] as the parade passed through the Gate and the second half of the song was drowned out by the thundering applause [. . .] Joy and happiness were everywhere" ("Sedanfeier in Berlin," 1914, p. 1).

The *Berliner Tageblatt* reporter did not tire of describing the excited emotional atmosphere. He spoke of a "celebratory mood" defined by "light-hearted seriousness" and "assured hope," concluding that these days would serve to "purify and strengthen the feeling of community." Other accounts of the event also allow us to characterise the Sedan Day celebrations as a ritual for generating and channeling emotional energy. The positive emotions were necessary to prepare the "hundred thousand" spectators for the future.

Why did the Sedan Day celebrations do such a good job of catalysing patriotic feelings at the beginning of the First World War? The ritual's choreography would have been familiar to most Germans. In the militaristic Empire of Wilhelm II, public festivals and celebrations were fashioned to strengthen the nation, particularly when the military participated. Indeed, such rituals provided a good occasion to make national community tangible (Vogel, 1997, p. 34f.). This Sedan Day was no different. The practiced Berliners came early enough to get a good spot and then ate their breakfast in happy anticipation. Schools were closed and children were allowed to sit right up front in order that they, more than any other, should never forget this day. As the military parade went through the streets, "thousands of little flags" were waved, "drums and whistles, the sounds of war" could be heard and "cheers of 'hurrah!'" became louder and louder. The emotional high point was when a "thousand voices" sang *The Watch on the Rhine* in front of the King's palace ("Sedanfeier in Berlin," 1914).

Six days later, a woman from Berlin named Sanna Wimmel described the singing in a letter to her son Hermann:

> After a while the drums announced the nearing of the moment we had been waiting for. Raging calls of hurrah greeted the parade, which, led by a proud officer, marched through Brandenburg Gate. The sounds of the regiment playing *The Watch on the Rhine* carried brightly over the celebration. The cheers of the people knew no bounds. The excitement took my voice away, I just moved my lips and quietly spoke the song's lyrics and at the final verse, a knot formed in my throat and tears welled up in my eyes. A small group came from the grey army of millions who keep watch on our Empire's borders and now stood before my eyes. They were you, ours, my sons, my nephews and kin and it was as if your voices embraced me with the sweet end of the song: "Dear fatherland, be calm; firm and true stands the Watch, the Watch on the Rhine."
>
> (Böhme, 1915, pp. 51–52)

Wimmel's account of her emotions while hearing the singing of *The Watch on the Rhine* is remarkable and is similar to many accounts of the days after the war broke out in the summer of 1914. The emotions of the masses were again and again being channeled in nationalist songs. *The Watch on the Rhine* in particular was sung repeatedly in various contexts during this period. The "effervescent sound of people singing" this song was what accompanied soldiers from the cities and provinces of the German Empire as they marched to war (Kollwitz, 1989, p. 152, diary entry from 10 August 1914). It is not surprising that the singing of this song served as an emotional trigger. At the turn of the century, it was one of the most popular songs in the German Empire. Alongside *Heil Dir im Siegerkranz* [*Hail to Thee in the Victor's Wreath*] it played the role of a national anthem (Scherer & Lipperheide, 1871). The German population had thus learned to feel patriotic with the song *The Watch on the Rhine*. The song's origins practically predestined it to take on this exceptional role in the German Empire. In 1840, a time when France and the German Confederation were contending over their respective claims to territory west of the Rhine, the 21-year-old poet Max Schneckenburger penned the poem *The Watch on the Rhine*, with its striking verses: "Dear fatherland, be calm, firm and true stands the Watch, the Watch on the Rhine." The poem strengthened Germany's will to defend the Rhine border with France at all costs. In 1854, Karl Wilhelm put the patriotic poem to a melody. But it first became famous during the Franco-Prussian War of 1870–1871, when, according to many accounts, German soldiers often sang it to prove their courage and resolve to fight or to celebrate their victories.

Apparently, there was even a "singers' war" at Nancy train station in 1870, where 300 French prisoners of war sang the *Marseillaise* as a sign of resistance and were drowned out by thousands of German soldiers thundering *The Watch on the Rhine* (Moßmann & Schleuning, 1978, p. 29).

In August 1914, this song, invested with patriotic emotions as it was, played a central role in war mobilisation and Sanna Wimmel's letter documents all too clearly how it stirred up pro-war sentiments at a military parade. Collectively singing a song that symbolised Germany's victory over France had a number of functions. It gave people a sense of security, strength and belonging. In previous Sedan Day celebrations, Germans had been told that German soldiers had the song on their lips when they defeated the French at Sedan in 1870. Indeed, the text and the song's form communicate strength, a sense of superiority and self-confidence (Moßmann & Schleuning, 1978, pp. 31–34).

The incantation "Dear fatherland, be calm" as the German soldiers on the Rhine stand "firm" and "true" may have also consoled anxious, concerned mothers who were afraid to watch their sons enlist. Above all, however, numerous patriotic celebrations and festivals honouring the Kaiser had taught Germans to feel certain of victory and fidelity and devotion to country and Kaiser when the song was sung. Thus, although the outbreak of war made the situation in the summer of 1914 different, these familiar feelings could be transferred to an unfamiliar situation by using familiar practices (cheering, flag waving, singing *The Watch on the Rhine*). Well-rehearsed during the years

of the German Empire, patriotism was the central emotional style of the summer of 1914. With their singing and cheering at the Sedan Day celebrations, Germans bolstered the widely propagated conviction that the war would be short and victorious.

But in the face of increasing casualties and defeats on the Western Front in late autumn, the summer's feeling of certainty began to crumble. To compensate, the German Empire tried to cultivate patriotic feelings through propaganda. The exuberant, galvanising patriotism was conserved in the form of "sound pictures" on shellac records to be played in German sitting rooms in the winter months as the lists of the dead grew longer. Deutsche Grammophon produced one such propaganda record at the end of 1914 that essentially presented a re-enactment of the mobilisation on 1 August 1914.[1] Lasting six minutes, it mixed cheers and speeches with patriotic music and the purportedly spontaneous singing of songs like *The Watch on the Rhine*. Sounds of marching feet, voices and train whistles lent the recording a veneer of authenticity and spontaneous excitement. The point was to remind listeners of the high times of the summer and to allow them to relive them.

The events of the summer of 1914 show how a song can be deployed to manage emotions. Because a large part of the German population had learned to associate *The Watch on the Rhine* with patriotic feelings, these feelings could easily be summoned at the Sedan Day celebration by singing it. Additionally, the Empire used the song in propaganda intended to reactivate and mobilise the desired emotions, as the recordings show. The later history of *The Watch on the Rhine* shows that it was precisely this positioning of the song as a trigger of patriotic emotions and the manipulative usage of the song in the German Empire that led to its ban in the Weimar Republic. But in nationalist contexts it was still a song of victory and recognition.

Singing in the Sachsenhausen Concentration Camp as a Form of Torture

Collective singing remained a common practice after the collapse of the German Empire and the Weimar Republic. Even in Nazi concentration and extermination camps, prisoners often sang, either in secret or because they were forced to (Brauer, 2016). According to sociologist Wolfgang Sofsky, the camps were "laboratories of violence," marked by "absolute power," a "universe of total uncertainty." [. . .] "Virtually anything can be ventured, repeated, intensified or halted, without reference to norms or goals" (Sofsky, 1999, p. 23). The use of music as a type of violence was not unique to Nazi camps, nor was music an exceptional kind of torture in this context. Nevertheless, I argue that the use of music as torture was refined and enhanced in the "universe" of "absolute power" that was created in these camps.

The Sachsenhausen concentration camp, which lay north of Berlin, was built in the summer of 1936. One of the first camps to be established, it was designed to serve as a model for subsequent camps. Sachsenhausen, along with Buchenwald, Ravensbrück and Neuengamme, belonged to a group of concentration camps that had been established on German state territory beginning in 1936 and which fell under the control of the Concentration Camps Inspectorate (*Inspektion der Konzentrationslager*, IKL) (Tuchel, 2004). They were intended as "re-education" camps for people who did not fit into what National Socialist ideology called the *Volksgemeinschaft* (people's community). The structure, organisation and politics of incarceration were similar in all of these camps, as were the conditions of inmates' daily lives. Thus, the following remarks on Sachsenhausen might also give us insight into the other concentration camps.

Recollections of forced singing in the prison yard feature prominently in prisoners' memories of targeted punishment. Especially after 1939, guards would often demand that they sing a song in the evenings after a long day's work. This was the most frequently used instrument of demonstrating their power and collectively humiliating prisoners in the central site of total power, the prison yard.

One can find descriptions of the degrading and energy-sapping ritual of evening singing in nearly all accounts of life in Sachsenhausen.

Wolfgang Szepansky, a survivor of Sachsenhausen, emphasised the routine nature of forced singing in the camp:

> Whenever it struck his fancy, the camp commander would demand a song. Then a stepladder would promptly be found for the conductor. He would climb up, announce the title of the song and then raise his baton. [. . .] The most popular songs were "Haselnuss" and "Fröhlich sein." In spite of the cheerful text and jaunty melody, it sounded more like a dirge when from the raw throats of tired men the slow and tortuous line would issue forth: "Then let us sing and be cheerful." The eerie sound would carry through the air all the way to Oranienburg. And if it was not found satisfactory, then the group would be interrupted and the song would start again from the beginning.
>
> (Szepansky, n.d., p. 8)

Prisoners experienced the order to sing as a form of violence. If a prisoner was unable to sing, the evening roll calls would be extended. Singing for hours and hours combined with standing at attention in the prison yard, regardless of weather conditions, required energy the prisoners needed in order to survive. This form of torture often caused the fatal collapse of already exhausted prisoners or, at the very least, hastened their demise. The survivor Hans Haase described it powerfully: "How often [SS guard Gustav] Sorge tortured us in the evenings for hours with singing or saluting by doffing our caps. It isn't possible to count how many men died of hunger, cold and wet weather or illness" (Haase, 1956, p. 84).

Most of the prisoners from the camps' first years were German, but after the beginning of the war, tens of thousands of men from all over Europe were deported to Sachsenhausen. In 1944, fewer than ten percent of the prisoners were native German speakers. The overwhelming majority of the inmates were not familiar with the German song repertoire, which remained unchanged until 1945. Not knowing the German songs was sufficient in itself to provoke punishment. The detainees would be chastised by the SS guards first for not knowing the songs and then for not singing them well enough. They could be subject to so-called *Strafsingen* (punitive singing).

Learning German songs was one of the first duties assigned to newly arrived prisoners. According to some Polish prisoners, SS guards often combined the memorisation of songs with physical exercise or physical punishment. SS guard Wilhelm Schubert linked the obligatory rehearsal of German songs with so-called *Strafsport* (punitive sports) ordering Polish prisoners to practise songs while remaining in a crouched position. Prisoners were forced to repeat this exercise again and again until he was satisfied with their singing. Polish survivor Aleksander Kulisiewicz recalled the particular painfulness of this situation: "It was sadism. The German songs had been nice but they became poisoned by this tyranny. We were forced to sing as if we were pleased, but we hated it" (Kulisiewicz, 1975, p. 10).

Forced singing was also used by SS camp guards while labour battalions worked. One such example was the so-called *Schuhläuferkommando*. The prisoners belonging to this labour battalion were forced to march around the prison yard in rain or strong winds to test the durability of military-issued footwear. The test course was laid out around the prison yard and dotted with a variety of materials, including stones, crushed rock, gravel and tar. During the day, prisoners would march 35 to 40 kilometres along this route wearing shoes that did not fit while carrying a load on their backs. At the same time, they were forced to learn songs such as *Weit ist der Weg ins Heimatland* [*The Way Back Home is Far*], which featured the refrain: "Man lives but once and then no more." From the prisoners' perspective, the songs' lyrics painfully parodied the situation in which they

found themselves and forced them to confront the hopeless reality of the camp (James, 1983, p. 23). In his study of music in the camps, Aleksander Kulisiewicz described another labour battalion called the "Singing Horses":

> The unlucky victims were harnessed to a heavily loaded barrow, which they had to pull. As they pulled they bent their bodies forward, their heads stooping low to the ground. Meanwhile they had to sing as loud as they could. The purpose was to simultaneously destroy muscles, lungs, chest, nervous system and vocal chords. They had to sing marching songs, rapid and lovely melodies, all of this, to enhance their despair.
>
> (Kulisiewicz, 1979, p. 40)

Kulisiewicz details the double nature of singing as torture: its ability, in conditions of absolute power, to destroy prisoners' bodies and, at the same time, to torment their minds. The term "musical sadism" describes exactly how the prisoners experienced these conditions. The example shows the extent to which the SS succeeded in using music as a form of torture, because it enabled them to destroy their prisoners' innermost identity. Survivors' recorded memories leave no doubt about the public dehumanisation that was intended and that resulted from this forced singing.

These incidents represent a reversal of the normal purposes behind the practice of collective singing. The practice had been used and continues to be used, as a source for recreation and pleasure. The collective singing of cheerful songs, a practice in which all of the prisoners regardless of nationality, religion or political belief had been socialised, was connected in their memories to enjoyable experiences and was part of what they considered their cultural practices. In contrast, singing on command in situations marked by the presence of pain, hunger, illness, fear and feelings of helplessness made a mockery of the original cultural intent and meaning behind collective singing. This forced musicality was an attempt to ascribe new meaning to the embodied emotional practice of singing. This process was compounded by forcing the prisoners to express positive emotions that were diametrically opposed to the actual emotions they were experiencing at the time. The records of prisoners' memories substantiate the claim that the context of absolute power in the contact zone of music perception enables the remodelling and restructuring of memories, meanings and emotions. Pleasure was replaced by pain, enjoyment by despair, the feeling of familiarity by fear.

Singing in the Free German Youth: Mobilising Youth in the Early German Democratic Republic

In 1946, the second edition of the book of songs *Singt alle mit! Lieder für Feier und Gemeinschaft* [*Everybody Sing Along! Songs for Celebrating and Coming Together*] was published after receiving permission from the Soviet military administration. The introduction states: "Singing? Amidst the rubble? Yes! say the hopeful. [. . .] These songs should make everyone joyful to be with others. We need joy, we need community during the arduous reconstruction work." (Magistrat der Stadt Berlin, Abteilung für Kunst, 1946, p. 3).

The education of emotions was marked out as a domain in music education for post-war music teachers and musicologists mainly in the Soviet Occupation Zone. Collective singing was thus seen as an appropriate means through which educators could make an impact on the feelings of children and young people. Discussions on emotional education in pedagogical circles went back to the pre-war period and were based on the notion that music is a medium of holistic human education that has the potential to shape hearts and minds. This pre-war discourse was based on concepts like humanity and morality. It reached its high point in the debate on artistic education (*musische Erziehung*), which in an extended sense could be translated as the "formation of human identities (*Menschenbildung*) through music" (Seidenfaden, 1962, p. 149). In parallel with the development of

the youth movement in Germany in the 1920s, the concept of "artistic" education emerged as a reaction to what were seen as the less desirable consequences of modernity (Freyer, 1928). The leaders of this pedagogical movement placed strong emphasis on emotional experience and learning about the world through cultural activities, such as music-making and singing. Their stated aims were the renewal of "holistic personalities," the recovery of the unity of life and music, an orientation toward the purifying power of music for the mind and soul and a search for pure, true, authentic community.

Music teachers in post-war East Germany were particularly attached to the ideas of artistic education, as they themselves had been socialised with the same methods in the 1920s and 1930s. Newspaper reports, memoirs and pamphlets for teachers and youth group leaders all insisted that collectively singing newly composed songs should play a key role in the education of children and young people. "Ultimately, we want to form people for whom the ideal of peaceful work and co-operative competition within the framework of the family of the peoples of the world is the highest ideal," states a pamphlet from the Institute for Music Education at the Martin Luther University of Halle-Wittenberg. "In order to attain this grand aim, all educational means are necessary, both the understanding and the soul" ("Denkschrift des Instituts," 1950, p. 31). It is remarkable that at that time nobody mentioned the misuse of collective singing for the Nazis' grand festivals and parades or in their youth organisations. The reason for this is that, on the one hand, collective singing had been common practice in Communist youth groups in the Weimar Republic, the Nazis having copied it from them. It was then taken up again by anti-fascist youth groups after the war without a second thought. On the other hand, the GDR conceived of itself in its core as an anti-fascist state, so that in the eyes of party functionaries, explicitly distancing themselves from similar practices in National Socialism was unnecessary.

The idea that collective singing could form a collective emotional style was not only important for the socialist education agenda. Debates in pedagogical circles revolved around concrete efforts to revive young people's joy for life. "Singing is an immediate human expression. It expresses emotional impulses and improves one's attitude toward life," claims an early syllabus from 1946 (*Deutsche Zentralverwaltung für Volksbildung in der Sowjetischen Besatzungszone Deutschlands*, 1946, p. 22). At the same time, singing had another decisive function: socialist spokespeople claimed that it would be capable of forming communities. "Music expresses deep feelings and emotions and unifies singers and listeners in a common experience. It makes life more beautiful, brings joy, chases off worry and gives us strength in our struggle" (*Zentralrat der Freien Deutschen Jugend,* 1952, p. 533).

Because of this trust in the emotional power of music, collective singing was instituted early on in both the Soviet Occupation Zone and the German Democratic Republic. This is evidenced by school records, summer camp programmes and documents on various meetings, celebrations and events for children and young people organised by the Free German Youth (FDJ) (Brauer, 2015). For instance, in 1950, more than 700,000 young Germans, most from the eastern part of Germany, travelled to Berlin to attend the *Deutschlandtreffen der Jugend* (German Youth Convention) the first large-scale gathering of young people since the founding of the GDR. The well-known documentary filmmaker Kurt Mätzig made a film on the festival called *Immer Bereit* ("Always ready") (Mätzig, 1950). The film depicts collective singing as a practice used to mobilise, communicate and regulate the emotions of the group.

According to the commentator heard in the film, the podium was staffed with both Germans and people from "other peace-loving nations." The international representatives greeted the attendees in their native languages, which were then translated. If what the camera shows is representative of the gathering itself, the majority of participants were young people in their blue FDJ uniforms. The galleries were decorated with banners featuring statements like "We're fighting for peace" and "March forth, German youth, for peace [. . .]." The stage was adorned with about 20 large flags in

the middle of which was an emblem of the earth almost completely covered by a "gentle" white peace dove (*Kongreß der jungen Friedenskämpfer entschlossen, Frieden zu erzwingen*, 1950, p. 1).

The film shows how the speakers fired up the crowd with their loudly spoken, powerful greetings, which were characterised by brief, clear messages addressed directly to the young people present. In turn, the crowd demonstrated their participation initially by applauding, eventually jumping up and chanting songs such as *Deutschland – Deutschland* or, when the Soviet representative spoke, "Kom-so-mol" (the Soviet equivalent of the FDJ). The camera captures the young people clapping and laughing ecstatically, carried away by the apparent enthusiasm. In the midst of the jumping, clapping, raising of fists and chanting, a marching band would start to play a melody or singers on the stage (precentors) would intone songs at which point many of those present would join the singing.

The film first features the refrain of the song *Bau auf, bau auf* and, in a later scene, the beginning of the song *Hymne der demokratischen Weltjugend*. The singing seems to have served as an outlet: afterward, the crowd sat down and listened to the speaker for a few minutes before beginning the whole routine over again. These scenes make it clear that the emotional power of singing was contingent upon the individuals' participation in the ritual of listening, jumping up, gesticulating, singing, chanting and sitting back down. Particularly remarkable is the way in which bodily imitation produced emotional community: one person would leap up, clap, sing or try to get the others to sing, which was then imitated by others until all were momentarily in sync. It seems that participants treated the songs as emotional symbols of their group identity, which could then be repeated in other rituals, thereby re-evoking the feelings of community experienced at the gathering.

These events, whether small or large, not only had the function of creating the assurance of a cheerful, strong community and giving individuals a feeling of belonging. At the same time, this community was presented as being morally good and superior. Young people asserted their solidarity with other nations, their support for "world peace," and their common struggle against "capitalist war mongers" and the alleged threat posed by the "Western powers" and "West Germany." These rituals named "the enemy" far more explicitly than the songs did, thus giving participants the chance to revel in the enthusiasm, joy and pride of engaging in collective struggle against a common opponent. Drawing on Randall Collins's theory of "interaction ritual chains," one might say that the experienced and confirmed feelings of "solidarity" were intended to hold the community together like "glue" well after the end of the actual ritual itself (Collins, 2004, p. 3).

To sum up, one can undoubtedly say that these events were used to generate compliance by mobilising and regulating the desired emotions. Is it possible to teach people to have a particular emotional attitude by having them repeatedly engage in collective singing in various settings? This, at least, was the goal of musical education in East Germany. How might the success or failure of such an attempt to teach emotions be measured? In the last part of this chapter, I would like to discuss these questions by focusing on the reception of collective singing in more detail.

Conclusion: Learning How to Feel?

In this chapter I have sought to show how conceiving of singing as an emotional practice allows us to combine a history of emotions approach with the history of the body and how doing so can reveal something about the power of music in concrete historical situations. At the beginning, I defined singing as an emotional practice. To help conceptualise the relation between music, emotion management and memory, I drew on the concept of the "contact zone," which enables us to see how music as an emotional praxis in a concrete situation is processed into knowledge of the "mindful body." Because music connects emotions, identity and memory, listening to music is at once an act of cultural self-confirmation and identity construction.

Given music's role in constructing the self by forming and reshaping emotions in the ontologically unstable contact zone, the example from Sachsenhausen Concentration Camp shows that music can be used as an instrument to mobilise and manipulate emotions. In the concentration camps, combining music with complete control over prisoners' bodies enabled guards to rewrite those aspects of a prisoner's identity that had been derived from music and musical experience. This reveals the body to be a contested site of both self-determination and heteronomy. In this struggle between the self and an external force over control of the body, the mindful body is subject to violent deformation. The self, which otherwise serves as a resource for resistance and survival, is in this concrete situation violated by music and, in the most extreme cases, destroyed by it.

The history of emotions can also help us gain a deeper understanding of the manipulative power of music. The examples of the Sedan Day celebrations in Berlin in 1914 and the event for German youth in East Berlin in 1950 demonstrate how collective singing can be used to produce, communicate, share and regulate emotions. The examples show that collective singing is a corporeal practice that forges a connection between emotions, memory and identity.

The anthropology of music and the history of emotions teach us that there is no universal relation between music and emotions, but rather that people's emotional reactions to music are culturally learned. In August 1914, Berliners knew how to feel when singing *The Watch on the Rhine* and the propagandists knew that they knew it. The command to sing in concentration camps had such a terrible effect on prisoners because it directly attacked their culturally shaped sense of self. And, of course, the leaders of the young GDR focused on a systematic manipulation of emotions through collective singing precisely because they hoped this would give them access to young people's thoughts, feelings and actions.

Is it possible to learn emotions by playing the same music again and again in similar situations? We might interpret group singing according to William Reddy as an "emotive," a special kind of emotional expression that can be defined as "an attempt to call up the emotion that is expressed; . . . [as] an attempt to feel what one says one feels" (Plamper, 2010, p. 240). This dynamic relationship between speech acts and felt emotions is encapsulated in the performative act of collective singing. The political significance of such acts always stands in relation to communities, which "have a huge stake in how people habitually use 'emotives'" (Plamper, 2010, p. 240). Following this argument, I would describe collective singing as a powerful ritual through which emotional ideals and norms are inculcated.

The theory of emotives is helpful here because "[e]motives are themselves instruments for directly changing, building, hiding, intensifying emotions" (Reddy, 1997, p. 331). One might thus surmise that the young people at the *Deutschlandtreffen der Jugend* (German Youth Convention) in Berlin in 1950 did not simply enunciate enthusiasm, collective strength and joy when singing songs like *Bau auf*; rather, in engaging in the emotive of collective singing, they might have felt, manifested and intensified these emotions, while at the same time suppressing or regulating others. However, in his theory of emotives, William Reddy foresaw the possibility that sometimes these special speech acts fail. Thus, it is just as conceivable that the emotions were simply named in the songs and had little influence on singers and listeners. "Trying to feel what one claims to feel" might not always work. Maybe there were young people in the crowd at the 1950 youth gathering who did not go along with the choreography, this cannot now be proven or disproven. Equally, it is likely that not everyone in the streets of Berlin in August 1914 shared the same patriotic enthusiasm as those shouting and cheering. Nevertheless, there is evidence for the fact that enthusiastic patriotism was the definitive "emotional style" of the summer of 1914 and that the education of young people in post-war Germany and their integration into the new social models was bound up with a specific mode of activating and managing emotions.

I would like to conclude with two important insights that can be drawn from this analysis. First, the examples demonstrate how important it is to bring methods of musicology into dialogue with

methods of historiography. Questions about emotions are a particularly fruitful point of connection, because both disciplines are deeply interested in them. Perspectives gained from the history of emotions make it possible to historicise music and its emotional effects. The history of emotions teaches us that emotions are far less universal than people have often believed and continue to believe. At the same time, however, the examples show how fascinating a source music can be for historical research. This brief study was able to take a close-up look at social dynamics and configurations of power through an analysis of collective singing in various historical situations. Thus, by combining methods in the study of their common object of emotions-research both disciplines have much to learn from one another.

Second, it is a matter of consensus that music and emotions have a special connection and one does not have to read a history book to think this. The question is what kind of emotions are experienced, remembered and learned through music and what kind of effects this has on thinking, feeling and action. Historical examples can help give us a more nuanced perspective on this question as well. Influenced by the Romanticism of its time, Schubert's *Ode an die Musik* mystifies music as a "beloved art" whose positive effects are so strong that they make life easier. The examples discussed here should demonstrate that the emotional power of music is not in itself morally good, but that it depends instead on who uses music in which way and to which end in concrete social situations.

Note

1 Around 25 shellac recordings were made for the series "Vaterländische Zonophon-Aufnahmen zum Besten deutscher Krieger und deren Angehörigen" (Patriotic Zonophone recordings for German warriors and their relatives), which played re-enactments of key moments of the war, including songs and marches. The feature on the mobilisation can be listened to on: www1.wdr.de/av/audio-mobilmachung-am—august-100.html

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SECTION TWO

The Twenty-first Century

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EMOTIONAL ACCOUNTS OF MUSICAL EXPERIENCE AND MUSICAL OBJECT

On the Relationship Between Music and Emotion[1]

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Introduction

When we are asking what music is and how we experience it, the most common answers tend to involve emotions and feelings. Respondents usually suggest that the essence of music is to express emotions and that music is something that moves us, contributing to well-being. They might also add that music gives us pleasure and that, in the specific case of "pure" or "absolute" music (that is, the music that lacks a title, text, programme and hints referring to any extra-musical context), we are able to feel a variety of emotions directly, without the mediation of language or the help of semantic meaning. Moreover, the idea that a satisfactory explanation of the nature of music and the way in which we experience it has to do with emotions seems to be supported not only by common-sense opinions expressed by a variety of listener types (the first-time listener, the one-time listener, the practiced listener and the jaded listener) (Levinson, 1987), but also by the people who work professionally in music (i.e. musicians, musicologists, philosophers of music and music critics).

In philosophy, the relationship between music and emotions has been investigated by thinkers from different philosophical traditions throughout history, starting with Pythagoreans, Damon of Oa and then Plato and Aristotle (see Pelosi in this *Companion*). In this chapter I will focus on contemporary approaches to the issue of music and emotions as developed in the philosophy of music within the analytic debate, (see Gracyk & Kania, 2011; Kania, 2017, pp. 17–40), sketching the main positions and classifying them depending on where they locate emotions: whether in the aesthetic experience, in the musical object itself or in neither. Where necessary, I will refer to authors who are not commonly considered to belong to the analytic tradition, such as Hanslick and Descartes. I will set out a summary of the main views on the topic of music and emotions as a starting point for the further scrutiny of specific arguments that each single view makes. I will briefly discuss how each position characterises the notion of well-being within its peculiar theoretical framework.

Broadly speaking, within continental philosophy, the philosophy of music investigates music as a socio-political phenomenon interpreted in the light of specific theoretical frameworks (such as

Marxism or psychoanalysis) or as a symbolic tool in connection with structuralism or poststructuralism (Davies, 2010). In the continental tradition, music has also been conceived as an art which, within a specific metaphysical system, acquires a certain function with respect to the different aspects of that system (see for example the place of music within the Hegelian dialectic and its relation to the other arts; or the role that music plays in Schopenhauer's conception of the "will"). In contrast, analytic philosophy of music is usually less socio-politically based and focuses more on specific problems. The method of the analytic philosophy of music is often characterised by the clarity of the argumentative structure and, more recently, by an interdisciplinary approach which links music, philosophy, psychology, musicology and acoustics.

Interest in the philosophy of music has captured professional philosophers' attention because of the different philosophical puzzles that it generates when compared to other artistic practices (such as literature or painting) and when analysed in itself. For instance, within a comparative approach to the metaphysical question of the ontological status of the work of art, music presents a particularly interesting case that has stimulated an intense philosophical discussion (Kania, 2017). Works of music have many different instantiations – i.e., musical performances – and their relationship to such a thing as the "musical work" has been the subject of much debate in various disciplines. Paintings, on the contrary, do not seem even to provide the possibility of having multiple instantiations since they can be simply identified as material objects (Kania, 2017). Similarly, when comparing music to literature with regard to the problem of interpretation, one could state that a work of literature is itself the only object of interpretation while instances of a musical work are performances that are at the same time interpretations of the work and also objects for interpretation themselves. Some, of course, would claim that the musical work itself can also be interpreted independently from any performance and evaluated for its intrinsic emotional content.

On a similar note, when focusing on music in itself, there is the problem of establishing the formal elements that constitute music, so that we might establish an intuitive starting point in order to distinguish what is music from what is not and what makes a performance a good one. Then, when analysing "pure" music, the questions that have been central to many philosophers' thinking are: how to account for music's putative capacity to express emotions and how to account for the arousal of emotional responses in the listeners when the emotional expression does not derive from the words, images or actions which might often go along with the music.

Music, Mind and Emotions

In relation to where the different views locate the emotions when focusing on the musical experience and the musical object, we can have two groups of theories: those that claim that the place of emotions is in the music; and those that argue that it is in the listener (Kania, 2017; Lentini, 2014). When emotions are in the music, they are usually identified with its content and they are required to be merely recognised by a listener, without her/him necessarily feeling them. When the emotions are located in the listener, in contrast, it means that the connection between music and emotions lies in the fact that music has the ability to make people feel emotions – music's special status would consist in this specific ability.

The difference between these two views has also been discussed in terms of the distinction between cognitivism and emotivism. Kivy (1990) states very clearly the terms of the debate between the two groups of theories:

> An "ancient quarrel" runs through the philosophy of music. It concerns the relation of music to the emotive life and I will characterise it here as the quarrel between musical "cognitivists" and musical "emotivists" [. . .]. Those I am calling musical emotivists believe

> that when, under normal circumstances, musical critics, theorists or just plain listeners call a piece of music (say) "sad," it is because it makes us sad when we listen to it; and what they mean by "sad" music, I will assume, is music that normally arouses sadness in the normal listener. The musical cognitivists, like the emotivists, believe that it is proper sometimes to describe music in emotive terms. But unlike the emotivists, they do not think that sad music is sad in virtue of arousing that emotion in listeners. Rather, they think the sadness is an expressive property of the music which the listener recognises in it, much as I might recognise sadness as a quality of a dog's countenance or even of an abstract configuration of lines.
>
> (Kivy, 1990, pp. 146–147)

Kivy claims that while cognitivists and emotivists agree on the intuitive fact that we might describe music in emotional terms, they tend to disagree on the actual explanation of it. Indeed, for the cognitivist view, the explanation is that we merely recognise an expressive property as the property of music, without necessarily feeling it; whereas for the emotivist view, the expressive property we associate with music is the same that we experience when listening to it since the crucial feature of music is that it generally arouses emotions in the listener. Kivy puts the debate in terms of a "moral crusade" when writing that:

> the quarrel between musical emotivists and musical cognitivists all too often seems to involve a sort of moral crusade. On the side of those who think sad music makes us sad, it is the crusade against heartless, emotionless, analytic listening to what rather to be a sublime emotional stimulus. On the side of those who think sadness is a property of some kind that we recognise, that we hear, in the music but do not feel, it is the crusade against wallowing in seas of emotional treacle while the truly musical passes by unnoticed.
>
> (Ibid.)

Kivy concludes that on the one hand, those who see the emotions in music fight against the extremisms of sentimentalism and blind patheticism of the emotivist view; on the other side stand those who see the emotions in the listener fight against the cold, analytic and intellectualist perspective of expressivity in music, which they attribute to the cognitivist point of view.

While both views acknowledge that expressivity and emotions have something to do with the very nature of music, in the taxonomy of the different positions on music and emotions which I propose based on the parameter of the location of emotion, we should necessarily include the position which maintains that it does not make sense to speak about emotions and expressivity in music at all, since the only features that matter when searching for the specificity and value of music are the structural dynamics which characterise a musical piece. According to this position, usually labeled formalism, there is no space for emotions, either when represented in the music or when "heard" by the listener. I would call this an "a-spatial" view of emotions in music, which was famously advocated by Hanslick in the nineteenth century and, more recently, by Zangwill (2004).

Although I am proposing a taxonomy which orders the current views on the relation between music and emotion by using the parameter of the location of emotions distinguishing between two possible "places" (the musical object itself and the musical subject, that is the ears of the listener) there seems to be also a state of mind which precedes the musical experience and contributes to the appreciation of music that can "host" emotions. This is the mental state of the aesthetic attitude that can be characterised as follows:

> The aesthetic attitude is, traditionally, an attitude, state of mind or a state of perceiving that is entered into, voluntarily and consciously, by an agent (spectator, subject, viewer,

> listener, etc.) that serves to [. . .] make the spectator receptive to the having of an aesthetic experience (in connection with the aesthetic object or event [. . .].
>
> (Fenner, 1996, p. 3)

The idea is that there are at least two consecutive mental states that contribute to a full apprehension of music: the musical attitude and the musical experience, where the former prepares, leads to and anticipates the latter. One of the features that commonly characterises the aesthetic attitude is that of emotional receptivity, which by registering and responding to an aesthetic object's expressive dimension, allows the musical experience to take place. If we want to offer a complete taxonomy of the accounts describing the relationship between music and emotions, we should include also the theories that "locate" emotions at the aesthetic attitude level. Of course, one should point out that the different accounts on the location of emotions with respect to musical experience, musical attitude and the musical object do not need to be embraced separately from one another, since one can perfectly well argue for the emotivist view and still support an affective musical attitude; or one can be on the cognitivist side and also favour the emotional receptivity of the aesthetic attitude. Probably, a coherent formalist view would not accommodate an affective account of the aesthetic attitude, since it would be problematic to justify how an emotional aesthetic attitude leads to an a-emotional musical experience. Anyhow, in order to provide a comprehensive picture of all the possible ways in which music and emotions are connected, together with the present classification, one should probably also give explanations of how the ontological categories mentioned, namely the musical experience, the musical object and the musical attitude, are interrelated emotion-wise. For the time being, by focusing on the consequences of each view at the epistemological level, in the next three sections, I will merely describe how the emotivist, the cognitivist and the formalist views relate to the musical experience and the musical object.

Cognitivism – Emotions Are in the Music

The core of the cognitivist approach is to maintain that expressive properties are inherent to music. Listeners are able to detect these expressive properties by *recognising* them as displayed in the musical content. Philosophers usually distinguish between the object and the content of experience. The object is the thing, the material object that we have an experience of (i.e. the real table we see when having a visual experience). The content is the actual aspect of the material object we see; it is the way in which the material object appears to us (i.e. the specific aspect of the table we see from a certain perspective). Things are even more complicated than that, since one can also say that our visual experience has content while there is no object to be seen in front of us. Nevertheless, in the present chapter I tend to use the terms interchangeably, with the only difference that sometimes "object" denotes the musical object in its entirety (i.e. a symphony, a quartet or a song), whereas "content" refers to the specific elements which the musical object is made of (i.e. the harmony, the temporal dynamics, the melodic lines, etc.).

Expressivity is a perceptual property of music that is not necessarily connected to our emotional response to it. Kivy's version of cognitivism tries to accommodate the intuitive fact that music has to be connected somehow to emotions with the fact that music is not a sentient being that can actually "feel" emotions (1980). Kivy gives a famous example to explain what he means by "recognising" the expressive properties in the music without either the music or the listener necessarily feeling them: while we see the St. Bernard dog as always having a sad face, he is unlikely to be feeling sadness constantly. We acknowledge that his face "is expressive of" sadness, without "expressing" sadness (see Eerola in this *Companion*). Similarly, music is expressive of some emotion without expressing either our emotional state when listening to it or the emotions of music itself (as if music was a sentient being feeling them) and not even the composer's emotional state at

the time of composition. Such a distinction allows emotional descriptions to be applied to music without the necessary assumption that someone is actually feeling them.

Kivy supports an enhanced formalism for which, on the one hand, there is room for emotions; on the other hand, there is respect for the objectivity of the inner structure of the musical form (2002, pp. 88–110). Given that the place of emotions is in the music, emotions are taken to be perceptual properties of the musical object that we have the ability to recognise. Therefore, the cognitivist's burden is to explain how those perceptual properties are embodied by music so that we are able to detect them. Actually, philosophers on the cognitivist side differ in the way in which they account for the embodiment of emotions in music. At least four different explanations of how we see emotions in music have been proposed (Budd, 1985, 1995; Davies, 1980, 1994, 2001, 2006; Kivy, 1980, 1990, 1999, 2002; Levinson, 1996, 2009).

Kivy supports the isomorphic or correspondence thesis, already suggested by Langer (1957), for which there is a resemblance between music and the auditory and visual manifestations of the emotional expressions in humans. Music is expressive of emotion by virtue of sharing the "contours" of vocal expressions or gestures made by human beings when having an emotional experience. When listening to music, we immediately perceive a certain similarity between the musical contour (contour theory), namely the profile of music that is determined by its content and some specific features that characterise human beings' emotional behaviour. According to Kivy, we detect the emotions in music by perceiving them unconsciously and this is explained by appealing to the evolutionary mechanism that justifies our tendency to see inanimate objects as displaying emotional behaviours, as when we believe we see emotional expressions in shadows or clouds. Davies (2011) also starts from the cognitivist shared basic idea that expressivity is embodied in music. The emotional properties of music are perceived by virtue of their being similar, auditorily speaking, to the expressive behaviours of human beings when feeling emotions. He highlights how a melodic line or musical dynamics can be heard as expressive of an emotion, such as happiness, by virtue of their resemblance to the general profile of a happy voice or by virtue of looking like a happy behaviour or posture. He emphasises that, "Music is expressive in recalling the gait, attitude, air, carriage, posture and comportment of the human body" (Davies, 2011, p. 10) and also argues that:

> the resemblance that counts most for musical expressiveness [. . .] is that between music's temporally unfolding dynamic structure and configurations of human behaviour associated with the expression of emotion. We experience movement in music – in terms of progress from high to low or fast to slow, say – but as well in the multistranded waxing and waning of tensions generated variously within the harmony, the mode of articulation and phrasing, subtle nuances of timing, the delay or defeat of expected continuations and so on.
>
> (Davies, 2011)

A challenge to Davies's account is that the resemblance between "music's temporally unfolding dynamic structure" and the "configurations of human behaviour associated with the expression of emotion" does not seem to be stronger/more relevant than the resemblance between musical movement and natural phenomena, like the weather or the waves of the ocean (Robinson, 2011, p. 202). Davies replies to this by maintaining that listeners just experience a certain similarity between the music and "the realm of human emotion" without caring about the degree of resemblance. We "anthropomorphise" the music; we "animate" it when we believe it to be the expression of an emotion, as we animate the face of a St. Bernard dog (Robinson, 2011).

Levinson develops the idea of "animating" music as well, suggesting a variation of the contour theory that explains the embodiment of emotions by claiming that the musical expressiveness we see in the music corresponds to someone, a *persona*, whom we literally experience as expressing her/his emotions. Levinson's idea goes as follows: "a passage of music P is expressive of an emotion

E if and only if P, in context, is readily heard, by a listener experienced in the genre in question, as an expression of E" (Levinson, 2006, p. 93). Starting from the ideas that expression "requires an expresser" (p. 93) and that music is not a sentient being so it cannot be music itself that feels emotions, Levinson postulates the imaginary existence of an agent in the music that possesses the emotional states expressed by music. He emphasises that "the expressiveness of music resides in the invitation that music extends to the listener to hear it as expression in the primary sense – that is, expression, by persons, of inner states through outer signs" (p. 92).

This idea applies not only when talking about vocal music, but also in the case of instrumental music. In the following passage, Levinson describes how someone's emotions are manifested to you when listening to Brahms's First Symphony:

> Summon up in your mind the opening of Brahms's First Symphony. You are inescapably presented, in listening, with the image of someone in the throes of emotion, which emotion is being manifested to you, through what one might call musical gestures. You may perhaps not know or be able to articulate, what emotion the agent heard in the music is in the grip of, but in the grip of it he is and this is something you directly hear. It is as if an emotion is being expressed, in the most literal sense, though it is somehow happening through music."
>
> (Levinson, 2006, p. 92)

Levinson claims that music is the expression of the inner states of a sentient being. His view is persuasive by virtue of providing a convincing theory of imagination (see also Trivedi, 2001, 2003, 2006 for a version of the resemblance-plus-imagination theory and Walton (1988) for a view that links musical expressivity to the ability of imagining our own psychological states).

Budd's (1995) starting point is to grant that there is a certain similarity between the emotional expressivity of music and the way in which emotions are experienced by human beings. Nevertheless, he thinks that we do not always manifest the proper feeling of an emotion by virtue of specific external behaviours or exhibitions of expressive gestures, since there are emotions that are not necessarily associated with bodily sensations, like melancholy or gratitude. Then, if music might also be expressive of these emotions, how can we account for the embodiment of emotions in music within an account that explains the isomorphic relation only in terms of the similarity between external behaviour and musical profile? Budd proposes to look at the very internal manifestations of emotions, namely, to how we feel "inside" when moved by something since music mirrors our inner lives. Whereas Levinson attributes expressivity to an external character, that is, an imaginary *persona*, Budd thinks that we experience musical expressivity by virtue of detecting a certain resemblance between our inner emotional states and the expressive properties of music. Budd's position seems to be "less" cognitivist compared to the other views presented because of the emphasis on the actual emotions felt by the listener.

After our brief survey of the cognitivist positions, we can conclude that beside the undeniable advantage of accounting for the expressivity of music by keeping the autonomy of the musical object, such positions face the problem of accounting for the more accurate explanation of the embodiment of emotions in music. Moreover, it seems that resemblance is not an informative notion that can correctly describe how music expressivity looks like human expressive behaviour, since just about anything can resemble anything else in some respect. As Trivedi points out: "All kinds of things may resemble how we vocally or physically or behaviourally express various mental states or the affective tones of these mental states, but they are not expressive of these mental states, even if we perceive these resemblances" (Trivedi, 2011, p. 227).

A more serious challenge to the cognitivist view is that it needs to explain why and how we are very often moved by music and feel emotions literally when listening to music. If emotions are in

the music, how can we explain the emotional reaction which musical listening often triggers? Actually, well aware of this challenge, cognitivists also work on the issue of why we are moved by music but they see this issue as not necessarily related to the expressive properties of musical objects. The emotivist view, on the contrary, does not have the problem of reconciling the expressive properties of the musical object with the undeniable fact that we are moved by music, since, in that account, the emotional experience is all we have to take into consideration when wanting to capture the accurate relation between music and emotions.

Emotivism – Emotions are in the Ears of the Listener

The core idea of emotivism or *arousal* theory is that music expresses emotions by arousing them in the listener. As a consequence, the expressive properties are dispositional properties of music instead of being perceptual properties. Musical experience plays a crucial role in the individuation of the expressive properties of music since it is in its specific occurrence that the expressive properties come into existence: it is *because* we are moved that we recognise specific emotions and attribute them to music. Different versions of this theory emerged in the last thirty years (Matravers, 1998, 2003; Nussbaum, 2007; Ridley, 1995; Robinson, 1994, 2005; Speck, 1988); I will discuss here the main ideas of the versions proposed by Matravers, Ridley, and Robinson.

According to Matravers (1998), we can talk about music in terms of expressivity only to the extent in which music puts us in the circumstances of feeling a specific emotion. Matraver's clear starting point is that if we want to explain what musical expressivity is, we should necessarily look at the emotional reactions we have when listening to it since it is not possible to give an exhaustive explanation of music expressivity by keeping the musical object separated from the musical experience. More precisely, it is the musical experience of the listener that determines the content of the musical object. The statement summarising Matravers' emotivist conception is: a piece of music expresses E if and only if that piece of music aroused E in the listener.

Having a musical experience is the necessary condition in order to recognise the musical object's expressivity. In addition, between the listener and the musical object there is a sympathetic relation, which is very similar to the sympathetic relation we have when dealing with people expressing their emotions. In both cases, when listening to music and when dealing with people, what matters is what we feel. Nevertheless, Matravers clarifies that we are talking of a more complex account than the one proposed by a simple stimulation theory, in which we merely react emotionally if appropriately stimulated. In his view, we should also be aware of the perceptual properties of music that caused our emotional experience. Moreover, for Matravers the kind of emotion that music can arouse in us is not a fully-fledged emotion but a mere feeling, a sensation that constitutes an emotional state that lacks a cognitive content. He makes this point when he writes that the state aroused by an expressive work of art is characterised by

> a feeling and not an emotion: that is, it does not have a cognitive component. [. . .] the 'object-directedness' of emotions is a consequence of their cognitive aspect; the intentional object of the cognitive state is also the intentional object of the emotion. The state which is aroused by an expressive work of art (for a qualified observer in the appropriate conditions) has no object. It is neither "sadness about something" nor "sadness at the thought that something."
>
> (Matravers, 1998, pp. 147–148)

Robinson (1994, p. 13) starts her analysis on the expressivity of music from the question of whether there is a relationship between the expressivity of music and the arousal of emotions through the music. In line with the basic emotivist conception, she suggests that the mere detection of musical

expressive properties depends on the arousal of them in the listener and emphasises the role of imagination to act as a bridge between musical expressive properties and their arousal in the ears of the listener. She claims that Levinson and Walton correctly stress the imaginary aspect involved in musical experience. Nevertheless, they do not show "how complex feelings, such as unrequited passion, stabs of pain or even sadness can be aroused by music whether in fact or in imagination" (p. 18). Moreover, these authors do not note that music often arouses emotions in us even without a cognitive mediation, which is often what is in charged in accounts on imagination proposed by Levinson (2006) and Walton (1988). There might be some emotions aroused by music that require a cognitive mediation, but music may also arouse more *simple* and *primitive* emotions by triggering them *suddenly*, without us being even aware of the kind of music we are listening to, whether a symphony or a quartet. "In particular," when "music can induce physiological changes and a certain quality of inner feeling [. . .], [it] can make me feel tense or relaxed; it can disturb, unsettle and startle me; it can calm me down or excite me; it can get me tapping my foot, singing along or dancing; it can maybe lift my spirits and mellow me out" (Robinson, 1994, p. 18). But what is more important in Robinson's account is that:

> Music can make me feel disturbed or calm just by perceiving it (listening to it). The feeling is a result of a perception and to this extent it has "cognitive content," but it is not the full-blown cognitive content required for tragic resolve, angry despair or unrequited passion. The sense of relaxation we feel at the end of "Tristan und Isolde," for example, is the result of the long-awaited resolution, after over four hours of constant modulation without resolution. The feeling is the result of a perception, but we may not even be aware why we feel as we do: the effect of the constantly shifting harmonic pattern affects us "directly" without conscious cognitive mediation (except, of course, what is required by our understanding of Wagner's style).
>
> (1994, p. 19)

Robinson concludes that the expression of a feeling by music can sometimes be explained straightforwardly in terms of the arousal of that feeling, as in cases like relaxation, surprise or merely tension. Those feelings are aroused "directly" by music and are different from the more complex emotions such as stabs of pain or feelings of unrequited passion.

The last emotivist author I would like to mention is Ridley (1995). His emotivist core idea is that: "[. . .] expressiveness is what it is for us just inasmuch as it involves our own affective states; and the recognition of expressiveness (and not merely of one kind of sign among others) is conceptually related to our capacity to feel" (1995, p. 53). Ridley develops the thesis that the recognition of expressiveness is conceptually related to our capacity to feel, starting from the concept of the embeddedness of music in our life. By virtue of being embedded in our life, music shares with it some characteristics and basic conditions (Ridley, 2004, p. 2). We cannot thus elaborate a theory on expressivity in music by regarding the musical experience and the musical object as autonomous and separated realms. Ridley's objective is precisely to underline the strong connection between them. He moves from a rejection of formalism to defend the claim that music expressivity is firmly related to the passionate character of musical experience. As cognitivists working on the most plausible conception of isomorphic relationship between musical expressivity and extra-musical expressivity, Ridley suggests that there is a specific link between the two. It has to be a resemblance relationship between music profile elements, such as timbre, dynamics, movement, phrase shape, harmony, and rhythm, which are called "melismatic" resemblances or, more simply, "melisma," and human beings' expressive behaviour which he calls the "melismatic gesture," "which may include both vocal and physical resemblances, owing respectively to quality of timbre and to quality of motion" (p. 49). The melismatic resemblance is the key to understanding how and why music looks

like human expressive behaviour. Yet, according to Ridley, the concept of melisma is not enough to explain music's expressiveness since melisma itself is not expressive, it only resembles something expressive. Therefore, for Ridley, together with the adoption of the melismatic resemblance, we also need to respond to the musical object sympathetically, if we want to understand what it is to experience music as expressive. By using the example of the weeping willow, often employed also by cognitivism supporters to explain the nature of the isomorphic relation, Ridley adds:

> It is rather like my coming to appreciate the melancholy of a weeping willow only as the willow saddens me: I could, of course, merely identify the expressive posture which the willow's posture resembles; but instead I apprehend its melancholy through a kind of mirroring response. I respond to it sympathetically.
>
> (Ridley, 2004, p. 52)

The main problem with emotivist views is that if the listener's reaction is what really matters when characterising musical expressivity and if the musical object is, then, a negligible element, we cannot really tell what is specific to a musical experience so that we can distinguish it from experiences which may be similar to musical experience but are caused by different objects. Emotivists do not take into account the aesthetic specificity of musical objects since they seem to equalise musical experience with experiences arousing similar emotions while being produced by different phenomena (as when we smoke or take drugs). How do we know that the same (expressive) emotional state cannot be aroused also by an object that is different from the musical object? Is there a way to distinguish two emotional experiences that, even if produced by different phenomena, look the same? Not to mention that the arousal theory does not seem to highlight the importance and complexity of the musical content (its melodic and harmonic structures, its form, its place within a specific musical trend, etc.) when appreciating music. Can musical experience just be the occurrence of an affective state lacking any peculiar aesthetic features?

Catching the exact nature of the relation between music and emotions is a tangled and an extremely complex task. I have discussed the most representative proposals in the recent literature, trying also to point out some of their weaknesses. An exhaustive theory accounting for both the importance of the emotional response and the relevance of the musical work is yet to be formulated, a difficult task as the two aspects of musical experience seem to be incompatible.

Formalism – There is no Space for Emotions

The formalist position is skeptical with regard to both the affective account of the musical object and the effective account of musical experience when searching for the value of music. Hanslick embraced this position in his 1854 book *Vom musikalisch Schönen* (*On the Musically Beautiful*) (Hanslick, 1986). He gave the book the subtitle "a contribution toward the revision of the aesthetics of music," which referred to the objective of arguing against the aesthetics of feelings and emotions that had been commonly associated with music since Descartes (see also Gouk in this *Companion*). The main idea is that neither the subjective emotional response to music nor the objective representation of emotions in the musical content constitute the crucial objective or value of music (Grey, 2011, p. 362). Hanslick's aim was to direct attention at the objective features of the musical composition determining the musical form, namely the harmony, the melody and rhythm. His view is not explicitly directed against the emotivist account since he does not claim that emotions are totally irrelevant to the experience of music; rather it is directed against the cognitivist approach since he maintains that emotions do not constitute the actual content of music (Hanslick, 1986, pp. 8–27). This negative thesis is followed by the positive thesis for which, broadly speaking, the content of music (which, in his view, corresponds also to the beauty and the value of music) is its form.

A contemporary philosopher who aligns his view to Hanslick's is Zangwill (2004). He defends Hanslick's negative thesis when he writes:

> Should we understand music in terms of emotion? I agree with Eduard Hanslick: the answer is "No." Let me count the ways that there is no essential connection: it is not essential to music to possess emotion, arouse emotion, express emotion or represent emotion. Music, in itself, has nothing to do with emotion.
>
> (Zangwill, 2004, p. 29)

Zangwill discusses the different accounts of the connection between music and emotions that correspond to different varieties of cognitivism (when discussing how music can express or represent emotions) and emotivism (when discussing how music can arouse emotions). He also argues against the account for which music literally has emotions, which I will regard as an extreme version of cognitivism.

In order to argue against the idea that music literally possesses emotions, Zangwill claims that given that emotions must be felt by a rational being and given that music is not a rational being, music cannot literally have emotions, in the sense of feeling them. Against the claim that music arouses emotions, he analyses the emotions of pride and fear by elaborating an argument that is usually also developed by cognitivists arguing against the arousal approach of emotivists. The argument starts from the commonsense folk psychology assumption that almost all emotions have an intentional content, namely, they are about something, they are directed toward either a state of affairs or an object. When we feel pride, for example, there is something about what we are proud of and it seems to be very weird to claim that the object of which we are proud is music. It should be something different from music that makes us feel pride; if we feel proud sometimes when listening to music it is rather because music reminds us of something of which we are proud. Furthermore, the views for which music "expresses" emotions or is "expressive" of emotions – which are all forms of cognitivism – have the problems of using "expresses" and "expressive" in a technical-philosophical sense which easily contributes to the collapse of those views into the arousal theory or into the account for which music literally possesses emotions, both of which have already been discussed (Zangwill, 2004, p. 37). Finally, arguing against the idea that music represents emotions Zangwill starts from Wollheim's statement that there is a representational relation between two things when there is something sufficiently in common between the representation and the represented (Wollheim, 1980, pp. 137–152). When saying that music represents emotions it seems difficult to see "how we could really hear an emotion in the music, when music is composed of sounds and emotion is not. The category difference here is too great. Emotions have no sonic nature" (Zangwill, 2004, p. 41). Zangwill concludes that emotions do not play any significant role either when talking about the musical experience or when characterising the nature of music; rather they are a distraction when thinking about music or can be employed in a merely metaphorical sense to describe musical content.

There might be two ways of doubting the formalist view. One is to claim that it seems to be such a counterintuitive view that it is very hard to be fully embraced without any adjustments. As we said at the very beginning of the paper, there should be something deeply emotional in our experience of music that might explain why this is so important in our life and why it seems to be so important for human beings' well-being. Moreover, putting intuitions aside, Zangwill's account can be challenged by discussing the theory of emotions that he takes for granted and by doubting how he applies this specific theory to the case of music. He starts from the general assumption that a theory of emotions has to include necessarily the intentional objects of emotional states, while it is possible to embrace a different theory of emotions. This theory could be based on the idea that emotional states do not have an intentional object which corresponds to the

representation of an object or a particular state of affairs since emotions are perceptions of bodily changes (Prinz, 2004).

Despite these challenges, we should attribute formalism with having directed philosophers' attention toward the inner elements of music (i.e. harmony, melody, rhythm, style and morphological traits). This has helped to provide an objective analysis when building up a theory of musical experience correcting the extremism of a sentimental approach to the nature of music that is too biased toward the emotional and subjective response of the listener.

Cognitivism, Emotivism, Formalism and Well-being

The concept of well-being is usually connected to happiness, pleasure and all the emotional positive effects of events, objects and states of affair that affect us and contribute to a general state of high satisfaction (Diener, 1984). Therefore, the necessary minimal requirement in order for a well-being condition to occur in a person's life is that the person should actually feel emotions. In the activity of musical listening, a person could genuinely experience a state of well-being when actually feeling some specific emotions, i.e. happiness, release, joy or enthusiasm. Emotivism seems to be a better approach in order to meet the necessary minimal requirement for a state of well-being to occur. According to emotivism, the peculiarity of music is that of arousing emotions in the listener, therefore, when positive emotions are aroused, a listener might be able to experience a state of well-being.

Cognitivism affirms that music is expressive by virtue of representing emotions that we are able to recognise without always being able to feel them. Formalism does not even contemplate emotions as recognisable items. Given that both views share the idea that music is not expressive by virtue of the listener actually feeling emotions, then both accounts cannot justify the arousal of a state of well-being determined by music-related emotions. Nevertheless, one could still talk of a state of well-being within formalism and cognitivism if focusing on aspects of musical experience which are not strictly speaking related to the musical content but that constitute the overall experience of listening to music. That is to say that, there is still room for experiencing a state of well-being when positive emotions are aroused by activities which accompany the listening to music and that are somehow subordinated to it. For example, one could enjoy the positive effects of remembering past memories evoked by music or experience a positive sense of identity when listening to music in group or feel a sense of satisfaction for helping people in need when listening to a charity concert (compare for instance Hara & DeNora in this *Companion*).

Conclusions

By using the parameter of the *location* of emotions, I have reclassified different accounts on the relationship between emotions and music proposed in recent literature. As candidates for the location of emotions, we have "places" that correspond to the components that usually constitute the musical episode, namely the musical experience and the musical object. Musical experience and musical object are often characterised by appealing to emotions, which is to say that: 1) when having an aesthetic experience of music, we might focus on the different ways in which music arouses emotions (emotivism); 2) we could also merely focus on the way in which emotions reside in the musical object (by virtue of being expressed or represented in music) and on the way in which we recognise them (cognitivism); or we could say that there is no point to finding the location of emotions in the musical episode since emotions are neither in the musical object nor in the musical experience (formalism). All three views contemplate the arousal of a state of well-being: the emotivist view, in virtue of accounting for the possibility of feeling positive emotions when having a musical experience; while the cognitivist and the formalist views do so by allowing the occurrence

of positive effects which are not strictly related to the musical content, but are caused by activities or facts that accompany the overall musical experience.

Note

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13

UNDERSTANDING MUSIC, MIND AND EMOTION FROM THE PERSPECTIVE OF PSYCHONEUROIMMUNOLOGY

Daisy Fancourt

Introduction

> Psy·cho·neu·ro·im·mu·no·lo·gy . . . n. a branch of medicine that deals with the influence of emotional states (such as stress) and nervous system activities on immune function especially in relation to the onset and progression of disease.
>
> (Merriam-Webster)

The field of psycho-neuro-immunology is a modern discipline, yet its premise rests on an ancient theory that mind and body are in constant communication (Solomon, 2002). The field draws together over a dozen disciplines including psychology, neuroscience, immunology, endocrinology, behavioral medicine and psychiatry to explore how our biological processes are influenced by our mental events and processes and how these same biological processes also have the ability to modulate the function of the mind (Daruna, 2012). Research within this field over the last few decades has revolutionised the way we think about the brain, demonstrating that it does not orchestrate responses single-handedly but works in constant communication with our endocrine and immune systems. Truly understanding our psychological processes involves understanding our biological processes. This is a fascinating lens to apply to our exploration of music and emotion as it brings a wealth of biological research knowledge and a host of research tools that can be used to delve deeper into a complex topic.

This chapter will consider our understanding of music through the disciplinary lens of psychoneuroimmunology. It will consider the crucial question of how we define "music" when designing biological studies of emotion before providing an overview of some of the key psycho-biological paths involved in emotion processing. It will then focus on some case studies of research that has explored the short-term and long-term biological effects of listening to and making music and consider how combined psychological and biological data can offer us a fresh insight into the impact of music on our minds. Finally, we shall explore some of the cutting-edge biological research methods and how they could be applied to studies of music.

Developing Definitions

Over the last five years, several studies have reviewed the biological effects of music, looking at associations between both listening to and making music and changes in the activity of different

biological markers (biomarkers). In 2012, a chapter by Kreutz, Quiroga Murcia and Bongard (2012) discussed neuroendocrine effects of listening to or making music, reviewing changes in hormones within the body in response to music. In 2013, Chanda and Levitin explored neurochemical effects of listening to or making music, reviewing changes in neurotransmitters and neuropeptides (Chanda & Levitin, 2013). In order to gain a fuller understanding of these areas, in the following year Fancourt, Ockelford and Belai (2014) drew together these previous reports in a systematic review of all biological studies of music. This review showed that over 60 such studies had taken place relating to music, involving over 8,000 participants from 22 different countries. Both listening to and performing music were linked with changes in twenty-eight different hormones, neurotransmitters, white blood cells and proteins (and since, at least a further dozen biomarkers have also found to change in response to music). However, many of these studies had simply looked at the "input" of "music" and at the "output" of a "biological response" without considering what these terms really mean; a problematic approach to central concepts that has been a common theme in discussions of music, the emotions and the body (see Kennaway and Taruffi & Koelsch in this *Companion*).

Unpacking "Music"

Music is a complex intervention: singing in a church choir is a different experience to listening to hip hop, rapping, playing the violin in an orchestra, visiting a jazz bar, going to a classical concert or having the radio playing in the background. It is important that distinctions between different types of engagement with or exposure to music in research studies are made as we cannot assume the same biological responses to all types of "music." Consequently, Fancourt et al. proposed a model suggesting that four factors involved in music play a crucial role in biological responses: the aural sound of the music (such as the tempo and tonality), the physical act required to produce that sound (such as breathing or moving), the social elements of making music in a group, and personal responses such as memories and emotions (Fancourt et al., 2014).

Of course, "music" itself consists of many more sub-factors. However, these four are crucial as each of these factors on their own is associated with patterns of biological response. For example, physical activity is associated with changes in endocrine and immune activity (Ford, 2002). So it is important that we can distinguish between the biological effects of musical activities compared with the biological effects of non-musical activities. That is not to say that only studies that test the effects of the aural sound of music (e.g. with no physical activity or social exposure) have value. Rather, we should be able to appreciate and compare how adding social or physical components to music interventions or provoking particularly strong personal or emotional responses might augment or reduce their psychological and biological effects. As this chapter will discuss, within each of these four factors, we are also starting to understand the more nuanced effects of the finer details of "music," so as the number of studies in this field increases, so too will the sophistication with which we can describe the biological effects of different aspects and components of "music."

Unpacking "Biological Response"

Equally complex is the concept of music eliciting a "biological response." In some of the early studies on music and biology, authors assumed that music could impact directly on biological activity, "resonating" with specific biological markers (see Kennaway and Quiñones in this *Companion*). There was little consideration of the pathways that might link music perception with biological responses. Consequently, a follow-up paper to Fancourt et al. (2014) in *Psychology of Music* introduced the concept of psychoneuroimmunology in relation to music (Fancourt, 2014). This paper proposed that instead of merely looking at the direct effect of music on biomarkers, we need to consider the

role of mental events and processes (such as emotions) in relation to the biological effects of music. Indeed, within the field of music psychology, the last few decades have seen a rapid rise in studies exploring the impact of music on emotions (see Lamont in this *Companion*). Within the field of psychoneuroimmunology, the same decades have seen a growing body of research exploring the interactions between emotions and biology (Pressman & Black, 2012). Consequently, it is a logical progression to put a consideration of emotions at the heart of an exploration of the biological effects of music.

Therefore, before considering the specific effects of music on biological response, it is necessary to have an overview of how our emotions, hormones and immune system interact. This is an extremely complex topic with new evidence and theories emerging daily. However, there are certain broad pathways that are known to be involved, an understanding of which can provide a good foundation for exploring musical studies within this field.

Psycho-Biological Paths in Emotional Processing

A number of specific brain regions are involved in the production of emotions, the interaction of which provides different emotional responses depending on the circumstances (Toates, 2000). An important region is the limbic system, which is a central part of the brain that includes the amygdala, hippocampus and limbic cortex amongst other structures (Figure 13.1). The limbic system is important in linking the sensory processing of stimuli with emotional attribution. Another important region is the thalamus (from the Greek for "chamber"), which is a part of the brain involved in relaying sensory and motor signals and communicating in particular with two key areas. One is the cortex, which is a region of the brain involved in memory, perception and cognition. The prefrontal cortex specifically integrates information on the current situation, past emotional memories

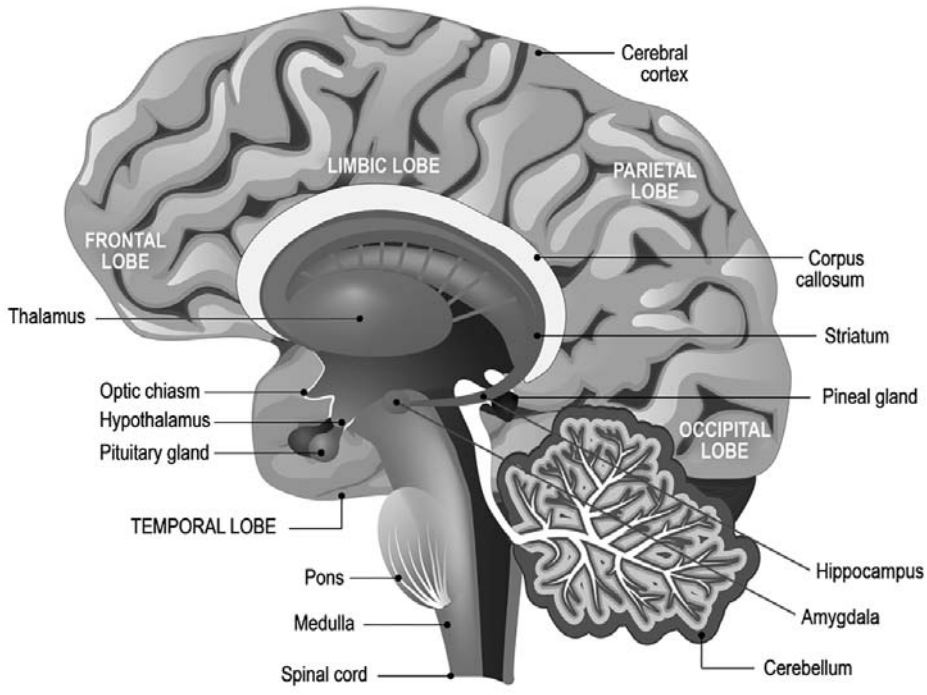

Figure 13.1 The human brain

and anticipated emotional consequences of the current situation. The other area is the amygdala (from the Greek for "almond"), which is involved in extracting emotional significance and sending signals to the hypothalamus (from the Greek for "under-chamber," denoting its position beneath the thalamus). The hypothalamus is an important link between the brain and two systems: the autonomic nervous system and the endocrine system.

The Autonomic Nervous System

The autonomic nervous system (called "autonomic" because for the most part it does not require cognitive processes to run) acts through transmitting signals via neurons. Neurons connect from the brainstem or spinal cord to different organs and are comprised of two types: sensory neurons, which monitor activity in the blood and organs and convey senses such as taste and smell, and motor neurons, which control activity within the organs including the skin. Messages are communicated between these neurons via the release of neurotransmitters including norepinephrine (also known as noradrenaline) and acetylcholine (Evans, Hucklebridge & Clow, 2000).

The autonomic nervous system is comprised of two divisions: the sympathetic nervous system (associated with the "fight-or-flight" response) and the parasympathetic nervous system (associated with the "rest-and-digest" response). In general, sympathetic and parasympathetic neurons exert opposing influences. When the parasympathetic nervous system is activated, it puts the body into a resting state, relaxing the heart, dilating blood vessels in the gastrointestinal tract, increasing blood flow and supporting metabolism. However, when the sympathetic nervous system is activated, it leads to various effects on different organs throughout the body, including increasing the rate and force of contraction of the heart, constricting blood vessels in gastrointestinal organs, activating sweat secretion, increasing renin secretion in the kidneys and releasing hormones called catecholamines from the adrenal medulla, a small conical organ on top of the kidneys.

Three of the most influential catecholamines are epinephrine (also known as adrenaline), norepinephrine (also known as noradrenaline) and dopamine. Epinephrine is released in response to emotions such as fear, stress and negative arousal. It can lead to physiological responses such as increased heart rate and shaking. Norepinephrine serves a similar function, increasing heart rate and also triggering an increase in the production of glucose in the liver and constriction of blood vessels. Dopamine increases heart muscle contraction force and heart rate, thereby increasing blood pressure. These catecholamines can affect immune activity too. Following initial release, they can increase immune activity, such as mobilising white blood cells, but if they are activated over longer periods of time, they can be involved in dampening the activity of these white blood cells and suppressing the immune system.

The Endocrine System

The endocrine system is a collection of glands, including the pituitary gland, that secrete hormones. One of the most important endocrine pathways in response to emotions is the hypothalamic-pituitary-adrenal (HPA) axis; a pathway involving the release of chains of hormones from the hypothalamus, pituitary gland and adrenal glands on top of the kidneys. The hypothalamus initially releases two substances called corticotropin releasing hormone (CRH), a hormone involved in stress response; and vasopressin, a hormone that conserves water within the body and narrows blood vessels. These start a cascade of hormones: CRH travels via a blood vessel to the anterior pituitary gland (the front part of the gland) where it stimulates adrenocorticotropic hormone (ACTH), which is released into the blood stream and travels to the adrenal cortex. The adrenal cortex is just next to the adrenal medulla where catecholamines are released following signals from autonomic nervous system, but the adrenal cortex is involved in the release of steroid hormones called glucocorticoids,

the most well-known being cortisol. Cortisol is an important stress hormone. In addition to responding to specific events, it varies across the day in diurnal cycles. But altered patterns of cortisol levels have been found in connection with a range of psychological conditions including stress, anxiety, depression and mood disorders.

However, this is far from a purely "downstream" action. The glucorticoid hormones released exert an influence back at the top of the cascade, suppressing CRH and ACTH production in the hypothalamus and pituitary gland to shut off the HPA axis: a "negative feedback" cycle. But if something goes wrong in this process, it can lead to prolonged high exposure to glucocorticoids, which has been found to damage the hippocampus with consequences such as reduced memory resources.

Like the ANS, the HPA axis is linked very closely to the immune system. In the downstream direction, as the HPA axis effect becomes stronger, the immune system becomes suppressed. Conversely, in an upstream direction, the immune system has the capability of altering HPA axis activity through the release of small proteins called cytokines which act akin to messengers.

Other Neurochemicals

In addition to these primary pathways, there are also several other neurotransmitters and neuropeptides that play an important role in emotions. One important neurotransmitter is serotonin, found in the blood, gastrointestinal tract and brain. It is involved in appetite, sleep and mood. It also helps with cognitive functions such as memory and learning.

Another important neuropeptide is oxytocin. Oxytocin is produced in the hypothalamus and released by the pituitary gland. It has been linked with social bonding and attachment, with higher oxytocin levels found, for example, in mothers and fathers in association with their social engagement with their children. It can also help to protect against stress (Heinrichs, Baumgartner, Kirschbaum & Ehlert, 2003).

A third group of neuropeptides important in emotions is endorphins. Also produced in the brain and pituitary gland, these are associated with feelings of euphoria and with inhibiting pain response.

The pathways and biomarkers described above form some important links between the mind and the immune system. But different emotions have been shown to activate these pathways and biomarkers differently. So we now turn to an examination of the biological correlates of specific emotions.

Biological Correlates of Emotions

There has been a wide body of research exploring the biological correlates of emotions. Two pathways have been proposed linking the two together: a direct pathway between emotional states and biomarkers and a "stress-buffering" pathway by which positive emotions can buffer stress response and negative emotions can further add to stress (Pressman & Black, 2012). Short-term high-arousal positive emotions such as laughter have been found to increase immune function such as increasing levels of antibodies such as secretory immunoglobulin A (sIgA) (which forms a defence against infections). These types of emotions have also been found to decrease levels of inflammation in the immune system. Short-term mid-arousal positive emotions such as happiness and joy have been found to increase the activity of white blood cells such as Natural Killer Cells. And relaxation, meditation and calm have been found to reduce inflammation. Longer-term positive moods measured over several weeks have also been found to be associated with more effective immune control of latent viruses, faster healing from wounds, lower levels of inflammation (Steptoe, Demakakos, de Oliveira & Wardle, 2012) and lower levels of the stress hormone cortisol when

awakening in the mornings (Dockray & Steptoe, 2010; Endrighi, Hamer & Steptoe, 2011; Steptoe, O'Donnell, Badrick, Kumari & Marmot, 2008).

Negative emotions too have been linked with changes in biomarkers (Segerstrom & Miller, 2004). Short stressful experiences have been found to temporarily upregulate natural immunity such as by increasing white blood cells such as Natural Killer Cells and levels of inflammation. However, longer-term stress, grief, shame and hostility have been found to increase levels of stress hormones such as cortisol, lower immune activity and also increase inflammation, all of which are linked to a range of mental and physical health conditions.

Research into the biological correlates of psychological states is a growing field. Although much still remains unknown as to the intricacies of responses to different emotions, the wide range of studies undertaken and breadth of data already acquired indicate the strength of the connection between mind, emotions and biology.

One of the challenges with exploring music, mind and emotions is how interdisciplinary to make the exploration: which fields of research might add to our understanding and help us to link the arts and science? As research is showing how mind-emotions-biology are all interrelated and how music-mind-emotions are also interrelated, it suggests that biology could be a valuable field and a strong platform from which to explore the effects of music. The rest of this chapter will look at some of the key research findings around music, emotions and biology and consider how we might take this forward.

Music, Mind and Short-Term Biological Effects

One of the most studied psychological states in relation to music is stress. To date, at least 29 controlled studies have been undertaken looking at the impact of music on the stress hormone cortisol as an indicator of HPA axis activity (Fancourt et al., 2014). Of these, the majority have shown reductions in cortisol in response to both listening to and performing music. In addition, at least 12 controlled studies have looked at the impact of music on adrenaline as an indicator of ANS activity. Of these, four showed reductions in response to music (Fancourt et al., 2014). Some studies have merely identified this stress-modulating effect of music in its own right. However, others have gone beyond this to look at broader biological effects of music.

One example is a study published in 2007 that looked at the effects of recorded music on intensive care patients. Due to the high levels of anxiety amongst patients on intensive care units, the study explored whether playing Mozart piano sonatas through headphones for one hour could physiologically and biologically relax patients compared to patients who received no music (Conrad et al., 2007). Although there has been much discussion as to whether Mozart is especially effective in inducing emotional responses or having health benefits (see Kennaway in this *Companion*), the study team explained that their selection was based on the fact that the slow movements of the sonatas had soft dynamics, calm tempi and melodic themes. So for patients who were sedated these factors were felt to be appropriate criteria in choosing "relaxing" music. Across the experiment, the control group showed increases in heart rate, blood pressure and a greater need for sedative than the music group, suggesting that music helped to reduce autonomic nervous system stress-related activity. There was also biological evidence to support this as adrenaline decreased in the music group but not the control group. In addition, there was also evidence of more general activity of the endocrine (hormone) system as the music group also had decreases in another hormone, dehydroepiandrosterone (DHEA), compared to the control group, and increases in growth hormone. There were also indications that music led to changes in immune function too as the music group had decreases in the cytokine (a type of protein) called interleukin 6 (IL-6), often used as a marker of inflammation, which were not found in the control group. The authors drew these different biological results together in proposing a biological pathway by which music led to

psychological, biological and physiological stress reduction involving the HPA axis, ANS and the immune system. Although the study has a small sample size and a specific clinical population, other studies have produced similar results to some of the biological results found here and this study is interesting in that it looks at a range of psychobiological responses rather than focusing on just one biomarker in isolation (Brunges & Avigne, 2003; Gerra et al., 1998).

Parallel reductions in psychological and biological markers of stress have not just been found when listening to music but also when performing music. In 2015, Eric Whitacre and his professional choir teamed up with the Centre for Performance Science (a partnership of the Royal College of Music and Imperial College London) prior to a public concert at Union Chapel concert venue in London. On the day before the concert, the singers took part in a low-stress rehearsal, before and after which they filled in anxiety ratings and gave a saliva sample. The following day, the singers sang the same music in a high-stress performance to 700 people at Union Chapel, completing the same data collection before and after. The study found that during the low-stress rehearsal, there was a decrease in levels of stress hormones in saliva (including cortisol and the related hormone cortisone), indicative of a decrease in activity of the HPA axis. However, during the high-stress concert, there was a significant increase in both hormones (Fancourt, Aufegger & Williamon, 2015). This finding, that the same music sung in two psychologically different contexts (high-stress and low-stress) produces different biological responses, supports the importance of considering the mind in studies on music and biology. However, this study also highlights the difficulties of directly linking psychological and biological markers. Although there was a decrease in stress hormones during the low-stress rehearsal, there was no psychological change in anxiety measured. Furthermore, at the same time that stress hormones increased during the high-stress concert, singers reported a decrease in perceptions of their level of anxiety. There are several explanations for this, for example there is a time lag in measuring hormones because they take several minutes or longer to be produced, whereas psychological reporting is much more immediate. So many studies do not find exact correlations between psychological states and hormones, especially for short-term interventions. However, it also shows that it is possible for biological activity to take place even when people are not aware of the impact music is having on them. This is an intriguing finding as it suggests that some of our response to music could occur without us being aware of it.

Beyond hormones, performing music has also been found to modulate immune function. Tenovus Cancer Care has founded over 20 choirs across Wales and England for people affected by cancer; whether patients, survivors or carers. Each week over 1,500 people sing in the choirs. Preliminary qualitative research suggested that participants were emotionally affected by being in the choirs, so a later study looked to explore this quantitatively (Fancourt et al., 2016b; Gale, Enright, Reagon, Lewis & van Deursen, 2012). Involving 193 participants in five choirs, the study found that a single hour of singing was associated with a significant reduction in negative emotions such as fear, anger, sadness and stress alongside a significant increase in positive emotions such as happiness and relaxation. Alongside these emotional changes, the study found decreases in the stress hormone cortisol and increases in ten different components of the immune system, including cytokines (proteins that communicate between cells), receptors (which receives chemical signals from outside the cell) and growth factors (including one which stimulates the production of stem cells). A number of associations between the psychological and biological data were found, including participants who experienced the greatest improvement in emotions over the session having the lowest levels of inflammatory proteins at the end. Although a preliminary study, this study has highlighted the interconnectedness of emotional and immune responses to music and led to on-going longitudinal follow-up work.

Finally, we also have evidence that the short-term emotional and biological effects of music can become stronger with repeat exposure to the music intervention. In 2014, the Royal College of Music established a series of group drumming workshops called "Mutual Recovery" for mental

health service users; whether patients or either formal or informal carers. Running on a weekly basis, the workshops consisted of 90 minutes of call and response patterns, learning new drumming pieces and some free improvisatory drumming. A total of 200 mental health service users were involved in the research studies surrounding these workshops. In one of these studies, saliva samples were taken before and after the first drumming workshop. There were found to be increases in four of the eight cytokines measured, but only a small non-significant decrease in cortisol (Fancourt et al., 2016a). However, the researchers hypothesised that this first session might not be a true representation of the effects of drumming because there were too many over-riding sensations. For example, many participants anecdotally described being nervous at the first session or socially anxious about being in a new group setting. So the researchers tested participants' saliva again before and after the session five weeks later. This time, there was a significant reduction in cortisol and increases in seven of the eight cytokines assessed (Fancourt et al., 2016a). Furthermore, psychological measures showed that alongside this reduction in biological stress response and general activation of the cytokine network, there were significant improvements in positive emotions such as happiness and decreases in reported stress levels. These results bear similarities to the Tenovus cancer care study in which similar reductions in cortisol and increases in cytokine activity were noted across a single 70-minute session of music-making. It is interesting that participants in the Tenovus study had all attended at least one prior choir session, with some attending as many as 40 or 50 previous rehearsals, which perhaps supported a clear biological pattern emerging. Consequently, the Mutual Recovery study highlights how conflicting psychological states can confuse our analyses of the biological effects of music. Furthermore, it raises interesting questions as to the design of future studies in order to mitigate these effects. In particular, it appears that when studying the short-term effects of music making, results are most reliable when testing populations who are already comfortable with the music activity. Or as in the Eric Whitacre study, conflicting psychological states need to be specifically manipulated in order to understand how they can alter our biological responses to music (Fancourt et al., 2015).

Music, Mind and Longer-Term Biological Effects

The impact of music on the mind is not just confined to short-term effects. There is growing evidence from a number of studies of the ability of music to affect longer-term mental states such as stress, anxiety, depression and well-being. For example, a 2011 study explored the longitudinal effects of music on people with depression. Participants who received music therapy in addition to their standard care showed significantly greater improvements in depression, anxiety and general functioning (Erkkilä et al., 2011). And a 2006 study involving in-patients with schizophrenia found that music therapy led to improved symptom scores compared to usual care (Talwar et al., 2006).

From a biological point of view, it has been shown that mental states and mental health conditions can be associated with patterns of biological activity. For example, depression has been shown in some people to be associated with heightened inflammation in the immune system (Dahl et al., 2014). As with short-term emotions, this is very much a bidirectional process: in studies in which inflammatory markers have been directly administered to people, they have been found to lead to depression-associated behaviours including fatigue, despair, reduction in social interaction, and suppressed activity (Capuron et al., 2002). However, as people are treated with pharmacotherapy, psychotherapy or a combination of both, inflammatory response has been shown to reduce (Dahl et al., 2014). A number of studies have shown that in addition to pharmacotherapy and psychotherapy for mental health conditions, psychosocial interventions such as tai chi, yoga and mindfulness also have the potential to reduce inflammatory response in people with mental health conditions (Slavich & Irwin, 2014). Music bears many similarities to other psychosocial interventions such as yoga in terms of facilitating group interaction, focusing attention into the present moment and encouraging

relaxation. In light of this, the Mutual Recovery project described earlier was also designed to test whether drumming not only led to psychological reductions in depression or anxiety but also reductions in inflammatory response.

In the same preliminary study discussed earlier, 31 mental health service users took part in six weeks of group drumming workshops. Across this period, participants demonstrated significant improvements in depression, social resilience and mental well-being and reductions in four inflammatory proteins, including IL-6 discussed earlier (Fancourt et al., 2016a). In order to extend this work, the team then undertook a larger controlled study over a longer period of ten weeks. Forty-five mental health service users, 30 experimental and 15 control participants, took part in a ten-week group drumming intervention or continued with usual involvement in other non-music community activities. As in the preliminary study, there were significant reductions in depression across 6 weeks in the music group and improvements in social resilience, but no changes in the control group. Between 6 and 10 weeks, these results became stronger, anxiety also reduced significantly and the drumming group demonstrated enhanced well-being too. After 10 weeks, the music intervention was stopped and participants were measured again at 3-month follow-up. All the results found at 10 weeks had statistically maintained over this 3-month period. Furthermore, alongside the changes in mental health and well-being, there were suggestions that there had been a shift in the ratio of pro-inflammatory to anti-inflammatory response. This study has been the first to suggest that music can modulate both psychological and biological responses longitudinally and attests to the potential of music not just to modulate short-term emotions but to affect the longer-term mental and physical health of participants. However, this study was non-randomised and involved a relatively small sample size so these longitudinal results remain under-explored in comparison to short-term changes. As a result, there is much work still to be undertaken if we are to gain a more complete picture of the interaction between music, mind, emotion and biological response across time.

All of the studies outlined here demonstrate that changes in emotions and mental health in response to music have been found to occur alongside changes in biological response. They are by no means the only such studies either but they are illustrative examples of the type of work that has been done in this field. Indeed, a recent systematic review of the biological effects of listening to music in clinical and non-clinical settings has highlighted findings from other short- and longer-term interventions These studies lend support to the hypothesis that music, mind and emotions are intrinsically linked with the endocrine and immune system. But do we understand why this is so?

Conclusion: The Future of Biological Research on Music, Mind and Emotion

This chapter has outlined the theoretical basis for exploring the biological impact of music, mind and emotion, some of the key biological pathways involved in processing psychological states and results from studies looking at both the short- and long-term biological effects of music. These have included states such as stress, anxiety, depression, well-being and both positive and negative emotions alongside biological changes such as neuroendocrine stress hormones, neuropeptides and cells and proteins of the immune system.

However, a key question remains: where is future biological research in music, mind and emotion heading? The data presented here are undoubtedly exciting; with each study there appear to be further biomarkers affected by music which then leads to new theories regarding the biological pathways involved in our response and the potential benefits for health and well-being. Consequently, future studies will be concentrating on expanding the range of markers analysed and on tracing these pathways in more detail. As the evidence base expands, it is also possible to start exploring the effects of music on biomarkers of particular importance to specific health conditions. For example, the Tenovus cancer care study showed changes in certain biomarkers that play crucial roles in cancer

progression, including cancer surveillance molecules such as tumor necrosis factor alpha (TNFa) and proteins involved in stem cell activity such as granulocyte-macrophage colony stimulating factor (GM-CSF). For now, it is not possible to determine the clinical implications found within this study, but it does raise the question of whether repeated exposure to music interventions could have a cumulative effect on certain biomarkers over time to such an extent that there is a clinical impact. This will certainly be an intriguing topic for future research.

Scientific developments are also opening new opportunities for research into the biological effects of music. For example, there have now been several studies on music and genetics. Human cells normally have 23 pairs of chromosomes (numbered 1–22 plus either an X or a Y sex chromosome). Each chromosome contains several hundred or several thousand genes and is divided into two regions: a short arm called "p" and a longer arm called "q." There have been a number of studies into how genes affect emotion and the variety of mechanisms such as stress that modify these effects (Bevilacqua & Goldman, 2011). In the last few years, we have also had the first studies into music and genetics. A study in 2014 found that several positions on chromosome 4 were implicated in singing and music perception, while several positions on chromosome 8q implicated in absolute pitch and music perception. They also found evidence of specific genes such as gene AVPR1A on chromosome 12q being implicated in music perception, memory and listening and gene SLC6A4 on chromosome 17q associated with music memory and choir participation (Tan, McPherson, Peretz, Berkovic & Wilson, 2014). Another genetics study showed that listening to music up-regulates certain genes, including those found in dopamine neurotransmission and cognitive functions such as learning and memory. Indeed, this same study found that specific genes such as SNCA, FOS and DUSP1 were affected; the same genes involved in song perception and production in songbirds (Kanduri et al., 2015). While such genetic studies are still in their infancy, with many showing only preliminary findings, this suggests that there could be important genetic underpinnings to the biological effects of music, mind and emotion that could revolutionise the way we conceptualise their interactions. As science advances to domains such as epigenetics, which studies how gene expression can be modified by external or environmental factors, aligning the study of music, mind and emotion with these advances will be valuable to our understanding of the processes at play.

Applying a biological approach to our understanding of music, the mind and the emotions is not merely a way of creating more scientific jargon around the edges of music. Rather, it could provide the keenest insight into our musical experiences. Neuroscience research is demonstrating in greater detail how thoughts, emotions and memories evoked by music translate through the limbic system (see Heggli, Kringelbach & Vuust in this *Companion*). However, this same limbic activity is also associated with biological response through the endocrine, immune and autonomic nervous system. Consequently, learning to read the patterns of these biological responses to music could support advances in music and neuroscience and provide us with a more direct and richer understanding of the complex thoughts, feelings and emotions evoked by music. The use of cutting-edge technologies to further scientific understanding brought together with the study of potential historical and evolutionary processes suggests the strongest path for future research.

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14

APPROACHES TO MUSIC, WELL-BEING AND EMOTION FROM PSYCHOLOGY

Theory, Method and Evidence

Alexandra Lamont

Approaches to Music, Well-being and Emotion

When thinking about how music can engender well-being, the notion of emotion immediately comes to mind. Emotion in music is probably one of the easiest topics to discuss in everyday life. Eavesdropping on daily conversations through the medium of online forums, we find people talking about how music makes people feel. "Songs that make you cry," the more seasonal and specific "Christmas songs that make you cry," and "Music that's too emotional" are just a few titles of randomly selected recent threads on a general chat forum. Eavesdropping further, the music that contributors name as being "too emotional" encompasses a broad range of styles, including songs such as *Bright Eyes* by Art Garfunkel, *Hurt* by Johnny Cash, *The First Time I Ever Saw Your Face* by Roberta Flack, *Red* by Daniel Merriweather, *Leave A Light On For Me* by Belinda Carlisle and Sondheim's *Send In The Clowns*.

The reasons people give for describing this music as "too emotional" are still more diverse. Personal associations are frequently mentioned – particularly funerals – but also associations with significant loved ones and with films and television series in which the music is used to accompany sad events (for example, *Somewhere Over The Rainbow* by Israel Kamakawiwo'ol which accompanied Mark Greene's death in ER). Many contributors also mention song lyrics describing how they evoke emotions or fit with times in their own lives. Some also talk about intrinsically musical sources of emotion, referring to instrumentation and harmony. To complicate things further, while there are common themes, more often than not one person's choice leaves another cold. Repetition can also dull emotions for some. One contributor noted that *Danny Boy*, a favourite of another, had "been so overused over the years that it has lost all meaning to me." However, what everyone agrees on from this snapshot of everyday discourse about music is that music of whatever kind "just gets you" emotionally.

This illustrates some of the complexities of the task facing music and emotion researchers. Music and emotion may be relatively easy to talk about, but as many researchers have discovered, explaining and theorising common mechanisms which may underpin these experiences is far more challenging. There has been a dramatic growth in research in this area and in the disciplines and traditions that are contributing to it. In this chapter I focus on general approaches to music, well-being and emotion from psychology. I explore the positivist approach to music and emotion, introduce concepts and frameworks from positive psychology and apply these to the current state

of understanding of both listening and performing. The chapter concludes with some suggestions for further development of the field.

How to Study Music and Emotion: Positivist Approaches

Since the advent of the modern discipline in the 1950s, most research into music and emotion has adopted a positivist approach, assuming that behaviour is stable, explicable and predictable and that studies can be designed to mirror real-life behaviour in controlled conditions, isolating and testing the effects of various predictors on outcomes (see Quiñones and Kennaway in this *Companion* for the antecedents of the modern approach). Following over 60 years of concentrated research attention, progress has been made toward capturing and measuring emotional responses to music. Tightly defined experimental research using behavioural measures like ratings of certain emotion words, discrimination between different emotional responses or continuous ratings of emotion have been used in conjunction with carefully controlled musical materials to explore the effects of different musical stimuli on listeners (e.g. Schubert, 2013; Vuoskoski & Eerola, 2011). Neuroscientific approaches to music and emotion have begun to identify which parts of the brain respond to musical stimuli, when an emotional response is detected in a piece of music and whether these emotional responses look similar or different in different listeners (Salimpoor et al., 2009). More recently, combinations of methods have been used with encouraging results. For example, listeners' self-reported judgments seem to tally with changes such as heart rate or facial expressions that can be measured by psychophysiological methods (Juslin, Harmat & Eerola, 2014).

One key distinction, particularly critical in relation to self-report and explicit verbal responses from participants, is between felt and perceived emotions (Gabrielsson, 2001). Early research was typically vague about which of these was intended, with researchers asking participants to "generally" rate certain emotion words in response to listening to different kinds of musical stimulus. More recent studies have carefully distinguished between the emotions listeners recognise in a piece of music (perceived emotions) and those they themselves feel in response to that piece (felt emotions), with the former being both more stable across situations and individuals and perceived as more intense (Hunter, Schellenberg & Schimmack, 2010). Indeed, the multitude of individual differences is a key feature of emotional response to music: although some commonalities can be identified, particularly in relation to the patterns of musical expectancy in tonal harmonic patterns, neuropsychology reveals dramatically different results when using experimenter-chosen music versus music that was preferred by participants (Steinbeis, Koelsch & Sloboda, 2006). "Chills" are more likely in the latter (see Taruffi & Koelsch in this *Companion*), as are brain responses involving the amygdala (Salimpoor et al., 2009; see Fancourt in this *Companion*). This tallies with experimental and survey findings that the affective and non-musical effects of music, such as to relieve pain, are also more marked when the music is chosen by participants (Mitchell & MacDonald, 2012).

A second issue concerns the need to maintain ecological validity and as will be shown below this represents a considerable challenge. Laboratory studies based on inducing emotions "artificially" by means of playing different kinds of often unfamiliar music to participants are very effective – in fact, music is one of the most popular methods of mood induction in general emotion research (Swaminathan & Schellenberg, 2015). Yet this is often far removed from the emotions listeners' experience in their own surroundings to music of their own choosing. The solutions to the challenge of ecological validity are diverse. Researchers sometimes ask for subtle comparisons: for instance, Juslin, Liljeström, Västfjäll and Lundqvist (2011) asked participants to report on generalised experiences as well as their last specific emotional response, while van Goethem and Sloboda (2011) asked participants about music and affect regulation under a range of conditions. This provides some solutions to the challenges of uncovering and explaining emotional responses to music and the positivist approach has generated different theories and models of behaviour, which are considered next.

Explaining Music and Emotion: Theories and Models

At present in psychology there is no single accepted unifying theoretical framework to explain music and emotion and the field is not wholly hypothesis-driven (see Juslin & Sloboda, 2010). However, different conceptual models are emerging. One recent popular model is that first proposed by Juslin, who has argued for underlying mechanisms (currently eight) that explain how music induces emotions (Juslin, 2013; Juslin & Västfjäll, 2008). Juslin has formulated different levels of specificity in musical response that may also reflect different areas of the brain and stages in evolution. The most primitive response in his BRECVEMA framework is the *brain stem response* to sound or pleasant sounds (B), held to be an evolutionary response related to arousal. *Rhythmic entrainment* reflects the listener locking in to a common periodicity in the music, through heart rate, breathing or actions (R). *Evaluative conditioning* reflects repeated pairing of the musical stimulus, at a fairly general level, with particular emotions, such as the use of horns to evoke jolly hunting scenes (E). *Emotional contagion* concerns the mimicking of the emotion perceived in the music by the listener, in a fairly automatic manner (C). *Visual imagery* reflects the shapes in the music and visual patterns in the listener's mind that are stimulated by the music (V). *Episodic memory* refers to the idea that particular pieces of music become associated with specific moments in listeners' lives, which tend to evoke emotions such as nostalgia (E). *Musical expectancy* (M) concerns the patterns embodied within the music that evoke tension and release, such as harmonic prolongation (Meyer, 1956). These combine to produce the final component, the aesthetic *response* (A).

The BRECVEMA mechanisms evoke musical responses that differ in specificity. For example, the brain stem response to sound explains why music evokes emotions in general, but not which music or which emotions; emotional contagion and rhythmic entrainment both reflect the fact that music is inherently social and shared; and audio-visual integration that music is typically accompanied by some visual stimulus. More specific cultural aspects are embodied in evaluative conditioning; responding to intra-musical patterns of expectancy reflects the specificity of a musical style; and finally, episodic memories explain the details of a listener's personal engagement with specific pieces. The model predicts that different types of information in musical events activate different mechanisms. Juslin et al. began testing this in a laboratory setting. In an ingenious study they manipulated the musical features of a single stimulus (randomly altering loudness levels, selecting a deliberately sad musical structure, inserting a familiar excerpt into the novel stimulus and violating melodic and harmonic expectations) to deliberately evoke four different mechanisms (brain stem reflex, emotional contagion, episodic memory and musical expectancy). Participants experienced the intended emotions (surprise, sadness, happiness/nostalgia and irritation) from these manipulations, as indicated by self-report of emotions and facial expressions and autonomic responses (Juslin, Harmat & Eerola, 2014). This also suggests that other mechanisms can be evoked in a multidimensional manner. For example, the version of the piece designed to evoke sadness through emotional contagion also evoked nostalgia. These are promising results, but the model has yet to be fully empirically validated and needs to acknowledge the importance of listening context.

A simpler framework for explaining emotional responses evoked by music is that proposed in a study by Schubert, North and Hargreaves, which suggests that a process of spreading activation may provide a simple explanation for aesthetic experiences of music. The authors propose that as long as the listener is primed for aesthetic experience, exposure to a given kind of music will unconsciously lead to enhanced reception of that music, thereby evoking emotions. Rather than simply focusing at the cognitive level, they propose that listener, response and situation are all involved in this process of spreading activation, which may go some way to explaining how musical experiences and memories have such depth and richness (Schubert, North & Hargreaves 2014). The impact of this work and its utility in interpreting empirical evidence also remains to be proven.

A hybrid model has recently been proposed by Eerola, suggesting that different levels of response to music might be distinguished from one another (Eerola, 2017; see also Eerola in this *Companion*). Eerola begins with the dimensional approach that characterises emotional responses in terms of their levels of arousal and valence; the next level includes the perception of basic emotions such as sadness or surprise, while the highest level involves what he describes as aesthetic emotions such as nostalgia or wonder. Eerola ties these to the kinds of measures likely to capture them, with dimensional responses illustrated by psychophysiological responses such as heart rate, basic emotions through verbal self-report and aesthetic emotions through narrative and metaphor. This provides a more complex multi-leveled approach to understanding different types of emotional response.

In this cognitive-dominated approach, little attention has been explicitly paid to the social elements of interactions with others and shared experiences. Moreover, their focus has almost wholly been on the experience of listening to music, largely ignoring the more interactive elements of music-making with and for others. However, when considering human emotions and well-being more generally these are central and some components of the cognitive approach touch on more social elements. Juslin includes several wholly interactive components (emotional contagion and identity) and one potentially "social" mechanism of associative memories, but these are less well understood and to date much less studied (Juslin, 2013). Social elements such as empathy may provide the fundamentals for understanding how and why music makes us "feel," and thus cannot be ignored: for instance, Vuoskoski and Eerola also find empathy one of the important predictors relating to emotional evaluation (Vuoskoski & Eerola, 2011). Empathy is an extremely appealing notion for understanding emotions since it enables us to connect various low-level processes (mirror neurons, perception-action mechanisms) as well as higher social aspects (prosocial behaviours) and emotion regulation to the functions and origins of emotional processes (Molnar-Szakacs & Overy, 2006). Neuroscientists have observed similar physiological and neural substrates involved in observing and experiencing emotions and the connections between empathy and prosocial behaviour and emotion regulation have been better elucidated during the last few years (Adolphs, 2010; Decety, 2011).

The social dimensions of music and emotion will need to assume increasing importance as the field develops and may necessitate a different approach altogether. Many researchers have included some element of self-reporting in their investigations of music and emotion and these have served as a starting-point for developing a different kind of theory of music and well-being which firstly assumes that participants have access to appropriate vocabulary to explain musical experiences and secondly that they have some understanding of how music works to elicit emotion and contribute to a general sense of well-being; this understanding of music's effects on emotions has a long history, as several chapters in this *Companion* attest. Before we can tackle this we need to address well-being as distinct from emotion.

Explaining Well-being: Happiness and Positive Psychology

Positive psychology provides a different lens to examine psychological experiences that involve emotion. Its primary focus has been on exploring and explaining happiness and well-being. In the simplest formulation, subjective well-being is defined as the presence of high levels of positive affect, low levels of negative affect and high life satisfaction (Diener, 1984). Drawing on notions from ancient Greece, Seligman distinguishes two concepts of happiness, hedonism and eudaimonia (Seligman, 2011; see Pelosi in this *Companion*). Firstly, hedonism purports that the pursuit of pleasure is what leads to happiness, encompassing the high positive affect and absence of negative affect in Diener's definition. Seligman labelled this the pursuit of pleasure or the search for the "pleasant life," arguing that one route to happiness is achieved by increasing positive emotion (P) (Seligman, 2002). Experiencing positive emotions such as joy and contentment has been shown

to have many benefits, including health and cognitive outcomes (e.g. Fredrickson, 2001). Secondly, eudaimonia is a different route encompassing living life in a satisfying way, overlapping with the life satisfaction element of Diener's original formulation. Seligman divides eudaimonia into four sub-categories – engagement (E), relationships (R), meaning (M) and accomplishment (A); the so-called PERMA model (see Ilari in this *Companion*). Engagement or the search for the "good life" refers to the pursuit of gratification through absorption in a given task or activity, termed "flow" (Csikszentmihalyi, 2002). Relationships with others provide considerable impetus for well-being, while meaning or the pursuit of the "meaningful life" refers to using one's strengths toward something larger than oneself, such as voluntary work or religion: spirituality, for instance, has been shown to contribute significantly to personal well-being (Wills, 2009). The final sub-category of accomplishment accounts for the importance of goals and goal attainment in contemporary society.

Seligman's PERMA model of well-being is also in an early stage of application in terms of research evidence but is gaining ground in positive psychology as a way of identifying routes toward well-being. Its strength lies in the greater emphasis on eudaimonia in achieving well-being, although balanced well-being requires all five elements. I will next consider how this approach might relate to the literature on music and well-being, considering music listening and music performance separately.

Explaining Music and Well-being: A Critical Approach

Music Listening and Well-being

Music listening has considerable potential to engender pleasure. Brain imaging studies show that music listening stimulates those brain regions involved in reward/motivation, emotion and arousal, regions that include the ventral striatum, midbrain, amygdala orbitofrontal cortex and ventral medial prefrontal cortex, which are also stimulated by other "euphoria"-inducing stimuli like food, sex and drugs of abuse (Blood & Zatorre, 2001; Panksepp & Bernatzky, 2002. See Heggli, Vuust & Kringelbach and Fancourt in this *Companion*). As reviewed earlier, laboratory studies show manipulating musical stimuli can induce different emotional responses in listeners and music is a powerful means of mood induction (Peretz, 2010). Music listening thus has the potential to evoke a direct hedonic route to happiness. Listeners and concert attendees most frequently state "enjoyment" as the reason for choosing to listen to music (e.g. Department for Media, Culture and Sport, 2006; Lamont & Webb, 2010). The seemingly involuntary response to music provides one powerful motivator to repeat music listening and music has positive effects without even requiring conscious attention (Juslin, Liljeström, Västfjäll, Barradas & Silva, 2008; Sloboda, O'Neill & Ivaldi, 2001).

Most of the emphasis to date in research has been on the hedonistic or more direct route approach to well-being, as outlined above (see also Groarke & Hogan, 2016). However, listening to music also has potential to evoke more eudaimonic elements and I consider these in turn in relation to Seligman's PERMA model.

Engagement through flow is possible through listening to music; Csikszentmihalyi included music listening in his original definition of the concept in 2002. He argued that listeners must have a high degree of attention and focus, setting aside time and space to engage fully. Previous studies had already argued that focused, self-chosen music listening provides a means to engage in reminiscence, catharsis, calming and other intellectual outcomes associated with high levels of engagement (DeNora, 2000; Sloboda, 1999), while further studies showed that more emotionally engaged listeners seem to gain more from concert experiences and have greater awareness of both their own music listening behaviours and their contribution to happiness (Greasley, 2008; Thompson, 2006). This strongly suggests that emotional and mental engagement enhances the listening situation.

Much research has illustrated how music can develop relationships and bring people together. Adolescents listen to most music alone, but still share a great deal of their music (Brown & Sellen, 2006; North, Hargreaves & O'Neill, 2000). By early adulthood many experiences of music listening are shared with others and music provides an important channel of communication in new social settings (Juslin et al., 2008; North, Hargreaves & Hargreaves, 2004; Rentfrow & Gosling, 2006). The social dimension might thus provide a way into a collective musical experience that fulfills the requirements of meaning by allowing the listener to go beyond him or herself as an individual (see also Konečni, 1982). A further element of relationships that music listening can facilitate is the sense of identity resulting from belonging to particular musical taste cultures and many researchers have emphasised this pursuit of identity as an important function of engagement with music (Tarrant, North & Hargreaves, 2002; Tekman & Hortaçsu, 2002).

Corresponding to the general lack of research on the component of meaning (Seligman, Parks & Steen, 2005), little research has explored how music listening can help develop meaning. However, music typically accompanies other activities that can be more clearly labelled as meaningful, such as religion (Sloboda, 2002). Becker has described the sense of collective ecstasy experienced in religious rituals by Muslim Sufis and Pentecostal worshippers. While the primary purpose of such rituals is not musical, the music, spirituality and group setting all combine to evoke strong emotions in those present and engaged, both at a personal and social level (Becker, 2001).

Finally, Csikszentmihalyi's notion of focused music listening is possibly the closest that music listening can approach to serving the function of accomplishment. It is possible that the sense of accomplishment that comes with knowledge of music (one of the most popular motivations to engage with music according to Schäfer, Sedlmeier, Städtler & Huron), may be associated with well-being outcomes, but this has yet to be explored (Csikszentmihalyi, 2002; Schäfer et al., 2013).

In an extensive of research looking at the importance of music in people's lives, Gabrielsson explored what he termed Strong Experiences of Music (SEM) (Gabrielsson, 2001, 2010; Gabrielsson & Lindström Wik, 2003). Volunteer participants of all ages were invited to write in as much detail as they could about their strongest and most intense experience of music and over one thousand free descriptions have been analysed to date. Using content analysis, seven categories of strong experience were identified across the reports within a SEM Descriptive System: general characteristics, physical reactions, perception, cognition, feeling/emotion, existential/transcendental elements and personal/social elements (Gabrielsson & Lindström Wik, 2003). Although the sample contained a large proportion of trained musicians, most experiences were of listening rather than performing and occurred in live listening settings (Gabrielsson, 2010).

The elements in the SEM results incorporate most of Seligman's five routes to balanced well-being. Firstly, direct physical and physiological responses to the music such as chills are experienced alongside high arousal feelings of rapture and euphoria, ecstasy and intoxication (Gabrielsson, 2001). These are accompanied by many different characteristics of engaged listening, such as focused attention and complete absorption, changes in attitude, feeling embedded in the music and coming to hear things in a new way. Developing and enhancing personal connections through musical experiences helps support relationships. The more spiritual elements of transcendence such as offering a glimpse of God or heaven, out-of-body experiences and feelings of pure being are reflected in the accounts. This combination of factors may account for the power of such experiences in a range of therapeutic outcomes (Gabrielsson & Lindström, 1995).

The SEM project has begun to provide insights into listeners' memorable and lasting experiences of music. The central focus has been on the effect on the listener, both during and after the experience and on identifying the different elements of SEMs rather than exploring their co-occurrence within particular accounts (Gabrielsson, 2001, although see Gabrielsson, 2011). However it is only possible to fully understand the nature of a musical "response" by considering the listener, the music and the situation in a process of reciprocal feedback (cf. Hargreaves,

MacDonald & Miell, 2005). Thus more work is required to explore the particularities of the music and the situations that can evoke such strong responses. In my own research, inspired by and extending Gabrielsson's, I have identified several common contexts that seem likely to engender strong emotional experiences. Most experiences described by my young adults took place in live music settings, dominated by popular music contexts such as gigs and festivals (Lamont, 2011b). I have also explored the balance of different components of well-being within each individual account, applying an idiographic approach, finding that balanced well-being is present even in the shortest accounts. Participants typically report at last three different facets within a single account, for instance highlighting musical features, social connections and memories. As well as for young adults, strong emotional experiences have also been found to be central to the functions of music listening in self-reports from some older adults (Groarke & Hogan, 2016; see Hara & DeNora in this *Companion*).

In summary, from a theoretical perspective, music listening can potentially affect happiness through the pursuit of all Seligman's routes: pleasure, in terms of boosting positive emotions; engagement, in terms of highly intense focused music listening which changes the way listeners think and feel; relationships with others through shared experiences; meaning, broadly conceived of as spirituality and aesthetics; and finally accomplishment through engagement with music and knowledge around music (Seligman, 2011). Much research has explored music's power to affect emotions in broadly positive ways. Less is known about engagement, although this is a dimension that people are known to vary on and very little research has explicitly explored meaning or accomplishment in relation to specific instances of music listening (Greasley, 2008). However, in 2016 Groarke and Hogan confirmed Greasley's finding of individual differences in the emphasis placed on different functions of music. They found at least four different types of emphasis in reasons for choosing music listening, prioritising creation of personal space (for the end goal of entertainment), reminiscence (for emotional effects, particularly reduction of boredom or fear), transportation (relaxation, stress reduction and connections leading to personal meaning) or strong emotional experience (leading to social connections and personal growth). This framework provides considerable potential for future exploration in bringing together diverse fields with more explanatory power (Groarke & Hogan, 2016).

Music Performing and Well-being

In this section I consider the elements of Seligman's PERMA approach in relation to performance. Firstly, performing music can be a very direct emotional experience that engenders positive affect. For example, the physical act of singing, whether alone or in a choir, has been found to reduce levels of tense arousal and to increase levels of energetic arousal and positive hedonic tone (Kreutz et al., 2004; Valentine & Evans, 2001). Children's initial motivations to learn instruments are hedonic: 7- and 8-year olds say they began to learn an instrument because it looked like it would be fun, exciting or enjoyable (McPherson & Davidson, 2006). Persson found that the hedonic motive of playing for enjoyment was the most influential for adult piano performers (Persson, 2001; Lamont, 2011a). In Gabrielsson's SEM work, 19% of the reports addressed performance, with positive emotions dominating, particularly joy and happiness, rapture and euphoria and calm and peace (Gabrielsson, 2010; 2011). Interestingly, some of the physical characteristics of positive strong emotional experiences of listening or performing are also found in music performance anxiety, which is typically defined in terms of its physical symptoms such as increased heart rate/pounding chest, excessive sweating, dry mouth, nausea, trembling hands and cognitive symptoms such as loss of concentration and negative thoughts about the performance (Lehmann, Sloboda & Woody, 2007).

Considering the elements of engagement and flow in the eudaimonic approach to well-being, most literature exploring the development of musical performing skills highlights the importance

of motivation (extrinsic and intrinsic) in sustaining children's and young people's interest in active music-making (e.g. McPherson & Davidson, 2006; Woody & McPherson, 2010). Particularly in the early stages, the influence of other people has been identified as critical in providing necessary extrinsic motivation for a child to continue with music (e.g. Davidson, Howe & Sloboda, 1997). Differences in intrinsic motivation and achievement in music performers during childhood and adolescence have typically been interpreted in terms of the learner's cognitive orientation to learning (for example, self-concept, self-efficacy, attributional beliefs), which relates to the notions of autonomy and self-determination important for general levels of well-being (Austin, Renwick & McPherson, 2006; Ryan & Deci, 2000; Ryan, Huta & Deci, 2008).

This cognitive approach has also been linked to the state of flow. Playing and performing music has the potential to induce flow, even in infants and young children (Custodero, 2005). Gabrielsson and Lindström Wik found musical performances that reflected engagement with loss of self-awareness, indicative of flow: for example, "sometimes it is as if it isn't me who is playing. The fingers move by themselves" (Gabrielsson & Lindström Wik, 2003, p. 176). Flow may also predict long-term motivation and achievement. For instance, O'Neill found that higher-achieving children reported significantly more flow experiences with music than lower achievers (O'Neill, 1999; see also Fritz & Avsec, 2007). Similarly, Sloboda found that adults who remembered peak experiences with music before the age of about ten were more likely to pursue involvement with music later on (Sloboda, 1991). High levels of engagement and flow in music may thus provide a motivation to continue to re-engage with the activity (cf. Woody & McPherson, 2010). The most successful approaches to treating performance anxiety as a trait focus on cognitive and behavioural measures and flow has occasionally been referred to as a desirable state that might help reduce anxiety (Wilson & Roland, 2002).

In terms of relationships, held to be critical to an eudaimonic sense of well-being, music performance works particularly effectively firstly in terms of developing one's own musical identity and becoming a musician (Lamont, 2002). Becoming a performer is a somewhat separate achievement, with a fundamental goal of communication to an audience (Davidson, 2002; Hargreaves, MacDonald and Miell, 2005). Developing a positive identity is an important motivator. A lack of musical self-concept or musical identity leads many people to disengage from musical activities and managing transitions while retaining a positive identity is important for long-term success in a musical career (Juuti & Littleton, 2010; Ruddock & Leong, 2005).

Developing a group or social musical identity is also important. Persson found social motives and the importance of belonging to be the second most influential factor in motivating pianists to continue playing (Persson, 2001). These powerful social motives for musical engagement have been studied by Faulkner and Davidson, showing how members of a male choir feel that singing plays an important role in connecting with other people (family, friends and wider social groups) as well as communicating to others (Faulkner & Davidson, 2004). Even in small ensembles, the influence of others is an important motivator: for example, members of wind quintets reported they had formed the groups out of a desire to work with friends or other musicians whom they liked and respected and another study highlighted a sense of community amongst performers and between performers and listeners in their examples of strong experiences of performing (Ford & Davidson, 2003; Gabrielsson & Lindström Wik, 2003; see also Sawyer, 2006). Conversely, a lack of such positive social contact through music can lead to performers dropping out (Moore, Davidson & Burland, 2003).

From the perspective of positive psychology, the search for meaning is allied most closely with spirituality and religion (see Pelosi and Hicks in this *Companion*). However, as noted earlier, this has received very little research focus to date. It is likely that performers do reach a sense of transcendence and spirituality through their performances, as hinted at in some of Gabrielsson's findings of 2011, although this has yet to be fully documented. However, quality of life, which may relate to meaning

in some way, is clearly found to be higher in people engaging in musical acitvities (Clift et al., 2010; Johnson, Louhivuori & Siljander, 2017).

As noted earlier there is also far less research that focuses on achievement in its own right in music performance and while there is a wealth of research looking at achievement motivation in performers, typically during childhood, this has not been linked in any explicit way to well-being (e.g. Austin, Renwick & McPherson, 2006). This research has highlighted the importance of developing intrinsic motivation in order to succeed, but the performer's sense of well-being is rarely considered in this area. This is an obvious gap for future studies to address within an integrated approach, since an emphasis on accomplishment alone is particularly unlikely to lead to well-being amongst performers.

An Integrated Approach to Happiness and Well-being in Music Performing

As indicated by the diversity of research reviewed above, most research focusing on aspects of well-being and fulfillment for performers has tackled these concepts separately. However, the positive psychology approach to happiness and well-being implies that it is important to consider them in an integrated manner, as parts of a whole. Gabrielsson's SEM-DS provides one potential way to do this, as outlined earlier. However, while examples are given of strong performing experiences through illustrative quotes, the overall analysis has not separated out performing and listening SEMs and so it is hard to know how far the general descriptive characteristics and overwhelmingly positive emotions found in these experiences apply specifically to performing. I explored different types of accounts of strong emotional experiences of performing separately from listening, finding that while performers typically recalled elements of at least two of the routes to well-being, in many cases their accounts contained a considerable amount of negative emotion and performance anxiety, which is known to be a challenge to well-being in performance and to the continued practice of the activity amongst performers from students to professionals (Lamont, 2012; Steptoe, 2001).

Virtually all research on emotion in performance centres around the communication of emotion to the listener (e.g. Gabrielsson, 2003; Juslin & Laukka, 2003). Indeed, Juslin and Timmers point out that "[w]hat counts is the sound that reaches the listener, not what the performer is feeling," and very little research has considered the emotional impact of the performance on the performer (Juslin & Timmers, 2010, p. 478). Van Zijl and Sloboda began to explore this, finding that personal involvement with emotions varies at different stages of preparation for a performance (Van Zijl & Sloboda, 2011). Emotional playing featured in the earlier stages of preparation, while an expressive performance was found to consist of more detached and conscious communication, with a small proportion of felt emotion. Research with jazz musicians has suggested the importance of a link between flow and group cohesion in generating a state of intense emotional empathy through improvisation (Sawyer, 2006). These studies both combine the concepts of engagement and relationships, illustrating the fruitfulness of an integrated approach adopted from positive psychology to understanding emotions in music performers.

Seligman's PERMA model has also recently been considered in relation to professional classical musicians. Music students have been found to experience health-related problems, while professional musicians are prone to physical and psychological complaints (Altenmüller & Jabusch, 2010; Kreutz, Ginsborg & Williamon, 2009; Wynn Parry, 2004). Around a quarter of professional performers experience music performance anxiety and almost all professional musicians appear to experience stress (Langendörfer, Hodapp, Kreutz & Bongard, 2006; Steptoe, 2001). Ascenso, Williamon and Perkins explored the importance of each of the five routes to well-being in a group of professionals, focusing on their everyday experiences as professionals and more reflective thoughts about their prior career and training. They found evidence of all five routes in the professionals' discourse, emphasising self-concept and identity, positive emotions and engagement, social relationships

and the successful negotiation of transitions (particularly from student to professional) as ways of engendering a sense of accomplishment (Ascenso, Williamon & Perkins, 2017). This provides a promising starting point for further investigations of different populations in testing more explicitly how PERMA might be intertwined with the life of a performing musician, which could potentially be fruitfully extended to other domains such as composition or popular music.

Conclusions

Among others, Juslin et al. and Zentner, Grandjean and Scherer suggest that despite the prevalence of the experimental and cognitive approach, self-reported feeling is still recognised as the most important form of evidence about musical emotions (Juslin, Liljeström, Västfjäll & Lundqvist, 2011; Zentner, Grandjean & Scherer, 2008). Neuroscience offers clear insight into direct responses to music under tightly controlled conditions and it can provide important information on the nature and structure of emotional responses, but cannot provide insight on more reflective feelings, opinions and beliefs which shape everyday musical engagement for listeners and performers (see Kennaway, Eerola, Taruffi & Koelsch and Heggli, Vuust & Kringelbach in this *Companion*). Further qualitative assessment following on from recent and on-going studies might begin to shed more light on the nature of emotional experiences with music from a scientific yet more phenomenological perspective (Gabrielsson, 2010; 2011; Groarke & Hogan, 2016; Lamont, 2011b, 2012). It may be that the field is still mainly descriptive, but generating hypotheses is not the only route toward greater understanding. Collecting and analyzing more stories about the phenomenology of musical experience from both a listening and performing perspective may be a more fruitful way to extend our understanding of the ways in which music serves to affect our emotions and support our well-being. Applying theories such as Seligman's PERMA can help provide some coherence to these accounts and may provide a more stable basis on which to compare the effects of music to those of other areas of artistic, aesthetic and cultural life.

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PLEASE PLEASE ME!

The Pleasure of Music in the Brain

Ole A. Heggli, Morten L. Kringelbach and Peter Vuust

Introduction

The enjoyment of music is a uniquely human capability and perhaps one of the most important pleasures of life. As well as being pleasurable on its own, music is often combined with other pleasurable social activities, such as dancing or going to a party, as well as being an integral part of many rites and rituals. The presence of music is so inherent to many of these activities that they would be significantly devalued if the music was removed. In fact, performing, listening and experiencing emotion from music is a universal human experience, present in all known cultures and the neural mechanisms necessary for experiencing music are present even at a prenatal stage (Huotilainen et al., 2005; Vuust & Kringelbach, 2010a). Hence, music may reflect fundamental neural mechanisms that have been selected for and retained through the process of evolution. From an evolutionary perspective, it is hard to imagine that music would have survived as a human cognitive ability if it did not confer an adaptive advantage on our emotional state and possibly, by extension, our well-being (for a review, see Croom, 2012). In this sense, the benefits of a better understanding of human emotional processing are clear in most areas of music research trying to understand what music is and how it works. However, given the complex nature of music, the mind and emotions, it is not trivial to study how music can be translated into the range of emotions and the pleasure we experience. Only recently, with the advent of modern neuroimaging techniques, have we been able to begin to understand the neural mechanisms that are the basis of the pleasure of music.

The human brain is very complex, which necessitates a cautious approach to investigating the underlying mechanisms behind musical listening. Current human brain research can be performed with non-invasive techniques, such as electroencephalography (EEG), magnetoencephalography (MEG) and magnetic resonance imaging (MRI). These techniques use the inherent properties of the biological brain to track activity. EEG measures electrical brain activity through electrodes attached to the scalp. MEG records magnetic fields created by the electrical activity. MRI can broadly speaking be divided into structural and functional techniques. Structural MRI leads to anatomical images, whereas functional MRI (fMRI) measures brain activity through changes in the oxygenation levels in blood. While EEG has a long history of usage, MEG and MRI are more recent inventions and require more expensive equipment. Each method has its strengths and weaknesses, with EEG and MEG offering high temporal resolution at the cost of spatial resolution. MRI offers great spatial resolution, even sub-millimetre, but with a lacklustre temporal resolution.

These techniques allow for investigations of the neural foundations of musical emotion and pleasure. Still, the central question remains what it is about music that makes it pleasurable for the brain.

The Building Block of Music: Anticipation as a Key Element

There are multiple explanations for how music induces pleasure and emotions and the most likely explanation posits that music establishes, fulfills or disappoints anticipatory neural structures and mechanism set up within the music itself (Vuust et al., 2010). According to this view, it is the inherently self-referential and anticipatory characteristics of music that evoke emotions. It can explain how music triggers and synchronises with the reward system, enabling an understanding of music-specific emotions such as sensations of "groove" and "chills." As the rules governing music vary between cultures and genres, the anticipatory viewpoint fits well with music theory, as it is likely applicable to all types of music and not just Western tonal music (Gebauer, Kringelbach & Vuust, 2012). Understanding music is then related to the anticipatory interplay between local auditory events and a deeper structural layer partly inherent in the music as such and partly provided by the mental structures in the listeners induced by the music (Lerdahl & Jackendoff, 1996; Meyer, 1956).

Musical expectancy is therefore a process whereby emotions are induced as a result of a violation, delay or confirmation of expectations as to the continuation of the music. This can be exemplified in harmony by the expectations for chords in a tonal cadence, one of the most common tonality-defining harmonic movements in Western music. This is of course not news to music theoreticians. Investigating the mechanism behind these responses, however, led to an interesting discovery. In a pioneering study, Maess, Koelsch, Gunter and Friederici (2001) measured cortical brain responses to a chord that, while retaining consonance, did not fulfill the progression leading back to a tonal centre. These chords showed activity in brain regions formerly associated with violations of language syntax. This is consistent with the claim put forward by both musicians and musicologists that there are similarities between music and language both at the structural and pragmatic level (Patel, 2003; see Loutrari & Lorch in this *Companion*). In contrast to language processing which is known to be lateralised to the left hemisphere, Maess and colleagues found right lateralisation of the musical stimuli. However, subsequent studies of rhythm, harmony and melody indicate that these responses are more left lateralised in musicians, suggesting that musicians exhibit a more language-like brain activity in response to music than non-musicians (Herholz, Lappe & Pantev, 2009; Tervaniemi & Hugdahl, 2003; Vuust et al., 2005).

In subsequent studies, using fMRI, Koelsch, Fritz, Dy, Muller and Friederici (2006) also showed that subcortical structures mostly related to emotional processing could be found in relation to these musical violations. They found this to be true even with chords adhering to the prevailing harmonic context. Chords breaking harmonic anticipation may be perceived as colourful, interesting or simply erroneous and give rise to different emotions such as surprise or sometimes even pleasure (Bharucha & Krumhansl, 1983). Hence, these controlled studies of very simple musical sequences experimentally substantiate claims that have been made by music scholars while at the same time shedding light on the complex interplay between cortical and subcortical brain resources related to the musical experience (Meyer, 1956). Here, however, it is important to note that using neuroimaging techniques that are based on statistical comparisons in groups of participants also implies reducing the stimulus to basic components. Thus, the individual experience of the complexity of real music is a much harder task to investigate using these techniques, even though novel approaches with continuous scanning of participants while listening to real musical pieces allows for investigating brain processing in more realistic musical settings (Alluri et al., 2017; Vuust, Brattico, Seppänen, Näätänen & Tervaniemi, 2012).

Neural Correlates of Music Expectancy

The neural foundation of violations of harmonic expectancy is one of the better understood areas of brain processing of music. In a number of studies Koelsch, Gunter, Friederici and Schroger (2000) have investigated the neural processing of inappropriate chords inserted in an authentic cadence. Using EEG/MEG, they have found that a brain response termed the "early right anterior negativity" is elicited when a harmonically incongruous chord, in this case a Neapolitan sixth cord, is inserted within or at the end of a musical sequence. This response is localised to the inferior frontal cortex; to a component of Broca's region or Brodmann area 44 and its right hemispheric homologue. This area is often associated with processing of syntax in language. The findings are also reflected in processing of polyrhythms, which are shown to activate Brodmann area 47, an area primarily associated with language (Vuust & Roepstorff, 2013).

Expectation of simple repetitive sound patterns, such as pitch deviants in successive pitch trains has been detected even before birth, as indicated by the mismatch negativity (MMN) measured by EEG/MEG (Huotilainen et al., 2005). Moreover, studies in MMN show that the auditory predictive model is updated for each new acoustic event. This indicates a constant flux in the anticipatory structures of music during the listening experience, meaning that multiple systems of expectations coexist for different parameters and different time scales. Therefore, one can suggest that music should be seen as constantly evolving entanglement of expectancies created in different layers of the musical structure (Sloboda, 1985). These studies of musical expectancy can be used as models for understanding the predictive brain. However, we also gain solid experimental evidence that illuminates old discussions about how and why music can be experienced so differently by different listeners. We know for example that there is a tendency for Western listeners to subjectively impose accents or grouping, on isochronous sound events. This behaviour has been observed at least as early as 1894 and multiple theories as to its causes have been presented (Bolton, 1894). In an elegant EEG-experiment, Brochard, Abecasis, Potter, Ragot and Drake (2003) found that a soft tone inserted in a sequence of equally loud tones evokes a brain response with differing amplitude depending on whether it was placed on a strong or a weak beat according to a 4/4 metre. This exemplifies how exposure and experience shapes the way we understand music.

In summary, we can view musical experience as a constant interplay between structures of the actual music and the expectations of the brain that interprets it. These expectations are dependent upon long-term learning of musical structures (sometimes referred to as culture-dependent statistical learning), familiarity with a particular piece of music, short-term memory for the immediate musical history while listening to a musical piece and on deliberate listening strategies (Vuust, Ostergaard & Roepstorff, 2006). Brain structures underlying musical expectation are thus shaped by culture as well as personal listening history and musical training (Vuust et al., 2005). Moreover, as soon as one hears the first sound of a musical piece, anticipatory structures such as metre and tonality seem to be already in place and unavoidable (Brochard et al., 2003). Thus, the mechanism of music expectation may underlie other sources of musical pleasure such as brain stem responses, evaluative conditioning, emotional contagion, imagery, episodic memory and beat induction (Juslin & Vastfjall, 2008; Witek, Clarke, Wallentin, Kringelbach & Vuust, 2014).

The Timing of Music Expectancy

Expectation structures of tension and relief depend critically on the timing structure of music and can develop on a timescale that is much smaller than that which is required by harmony. The predictive structures underlying the anticipation of timing in music are provided by the metre, based on a fundamental opposition between strong and weak beats. The alternative structure of a metre is replicated on the global level of the musical form, but in principle also at smaller levels

of subdivisions of the pulse. Metre therefore provides the listener with a temporal, hierarchical expectancy structure, underlying the perception of music, in which each musical time-point encompasses prediction of timing and strength (Large & Kolen, 1994). When the expectancy structure of metre is violated, however, this may be followed by a strong perceptual response depending on the degree of violation (Vuust, 2000). Importantly, the hierarchical structure of the metre underlies all other expectancy structures in music (for example, rhythm, harmony, melody and intensity) in that it influences perception of any musical event. Hence, anticipatory structures such as metre (but also tonality for instance) provide the listener with a framework for interpreting and remembering music. With that in mind, the question arises how musical expectations can be translated into emotions other than those related to surprise.

The Brain Anatomy of Music Pleasure and Expectation

Music is able to affect and evoke a wide range of emotions, from disgust to euphoria (see Eerola and Taruffi & Koelsch in this *Companion*). The theory of predictive coding of music posits that it is the constant fulfilment or failure of expectations in different layers of the musical structure that convey and creates these emotions. An important aspect in understanding how musical expectations and emotions are connected is to investigate the brain networks involved in emotional processing (Kringelbach & Phillips, 2014).

Within the field of neuroscience, emotions are considered as complex states arising from the integrated activity of affect-generating brain systems. These include cortical regions such as the cingulate, prefrontal, insular orbitofrontal and temporal cortices as well as sub-cortical regions such as the ventral pallidum, nucleus accumbens, brainstem, hippocampus, diencephalon, as well as emotional effector systems which produce physiological arousal and motor system action. While neuroimaging research has allowed us some insight into the functional interconnections of the brain structures involved in emotion, these networks are complex and far from being well understood. Whereas functional specialisation of many brain regions have been mapped out in great detail over the last decades, the methodological tools for understanding how these areas interact and integrate information with each other are a relatively new addition to the neurocognitive toolbox. However, the understanding of functional and effective brain connectivity is a key area of interest for emerging approaches such as whole-brain computational connectomics and functional connectivity analysis. Here we will just mention a few findings from the study of music, which are similar to findings of other emotional stimuli.

Take, for example, the acoustic features of music, such as consonance/dissonance, loudness and timbre already represented in the auditory brainstem (Tramo, Cariani, Delgutte & Braida, 2001). These provide further input to the auditory cortex which acts as a computational hub, connecting limbic, paralimbic and neocortical connections in the affective-attentional network. As such, music would appear to use similar mechanisms as those used for the processing of affective vocalisations (Parsons et al., 2014). Similarly, regions like the nucleus accumbens have been shown to be sensitive to both primary and higher pleasures and to be active when music is perceived as pleasurable (Koelsch et al., 2006; Trost, Ethofer, Zentner & Vuilleumier, 2012). This is part of a larger network, where during rewarding experiences of music, functional connections with the auditory cortex emerge. Together with a connection to the orbitofrontal cortex this can be used to predict whether an individual will decide to buy a given tune (Salimpoor et al., 2013). Other regions, such as the hippocampus have traditionally been linked to emotion and memory and also to extramusical memories and musically evoked emotions, such as chills, joy, peacefulness and sadness (Blood, Zatorre, Bermudez & Evans, 1999; Trost Ethofer, Zentner & Vuilleumier, 2012).

In addition, the amygdala has long played a significant role in emotion research to both positive and negative stimuli. It has thus also been shown to be sensitive to music perceived as pleasant

(Blood et al., 1999; Koelsch et al., 2013). This could possibly be linked to the role of music as a stimulus which is perceived to have social significance due to its communicative nature and its similarities with affective prosody (Cross & Morley, 2009; Juslin & Laukka, 2003. For a discussion of prosody, see Loutrari & Lorch in this *Companion*). The amygdala exhibits activity in both subjectively joyful and sad music and it is implicated in coding the reward value of music, as well as evaluating and learning processes irrespective of positive or negative qualities of the stimuli (LeDoux, 2000; Murray, 2007).

When it comes to the qualities of music that engage these brain networks, the key conveyers are musical expectancy and tension. If we consider music to be a structured collection of sound, it is the structural factors that facilitate musical tension, such as a stable beat in comparison to a ritardando or the stability of a melody around its tonal centre. In the latter, a melody moving away from a tonal centre gives rise to tension, which is broken when the melody returns toward it (Lehne, Rohrmeier, Gollmann & Koelsch, 2013). Thus, it is the expectations in regards to the musical structures that are the key to music's ability to evoke emotions.

Predictive Coding of Music

When considering musical anticipation as a prime conveyer of musical emotion and pleasure, it becomes apparent that it requires a brain that can reflect on previous events and use this information to adjust its prediction of upcoming events. The theory of predictive coding explains how the limited capacity of our neuronal transmission channels is negated. This model proposes a hierarchical brain organisation whereby lower level brain areas estimate predictions of their expected input based on contextual information through backward connections from higher level areas (Friston & Kiebel, 2009). A comparison between prediction and actual input produces an error response that if sufficiently large, will be fed forward to call for an update of the model. This generates a recursive process, which aims at minimising the difference between input and prediction. This entails a brain that constantly tries to extract structural regularities from its surroundings. For music, this is represented in the structural nature of the auditory events. The human auditory system segregates the auditory environment into meaningful streams according to specific rules and this forms the basis of a prediction of the near auditory future (Bregman, Liao & Levitan, 1990).

The Pleasure of Music

Pleasure is never just a sensation or a thought, but rather appears to be part of the subsequent valuation of sensory stimuli needed in decision-making (Frijda, 2010). In particular, it is important in evaluating the hedonic valence, the intrinsic amount of pleasure arising from emotion and is likely to be present in many species. Much of our brain activity is not available for conscious introspection and neuroscientific evidence supports the idea that our non-conscious brain activity is instrumental in controlling our behaviour. In hedonic processing, some of this non-conscious brain activity may lead to hedonic activity, resulting in pleasures where we are not conscious of their origin (Kringelbach, 2004). It might then be useful to separate pleasure into components of non-conscious and conscious evaluative hedonic processing (Kringelbach, 2005). Pleasure then plays a central role in emotional and conscious feeling, but is not itself a conscious feeling.

Mechanisms of Wanting, Liking and Satiety – The Role of Dopamine

A critical aspect of the brain's functions is to balance resources between survival and procreation. As a strategy to achieve a balance, different rewards compete for the available resources (Berridge & Kringelbach, 2015). These processes give rise to a cyclical time course. We can think of the

pleasure cycle having three phases; wanting, liking and satiety; anticipation and learning help to initiate, sustain and terminate the phases. As such, anticipation plays a crucial role in guiding our decision making in order to facilitate allocation of brain resources.

The actual pleasure component or hedonic impact of a reward is considered by a large body of work to be most likely found during the liking phase, which contains at least two levels, a core "liking" reaction that does not need to be conscious, and a conscious experience of pleasure (Berridge & Kringelbach, 2008). Wanting is the primary motivation for the reward and is also comprised of two levels: a non-conscious basal "wanting," and a conscious desire for incentives or cognitive goal. During the satiety phase both wanting and liking of specific rewards are much diminished but learning occurs throughout the pleasure cycle. Learning mechanisms are based on past experiences and constitute the associations and predictions about future rewards. These predictions include explicit cognitive predictions and implicit knowledge that are acquired through associative condition. These different psychological components are mediated by partly dissociable brain substrates (Kringelbach & Berridge, 2010a). This indicates that pleasure is never just a sensation, even for the sensory pleasures (Kringelbach, 2010; Kringelbach & Berridge, 2010b; Ryle, 1954). The recruitment of specialised brain systems is necessary to add the hedonic and motivational drive to a sensation, rendering it a pleasure. This active recruitment of the brain's reward systems is what makes pleasant experiences "liked."

Dopamine is a key neurotransmitter acting to bind together the mechanisms of wanting, liking and satiety. The dopaminergic system is associated with the motivational salience or wanting, of a range of physiological and psychological rewards. These associations between the dopaminergic reward system and various pleasures, such as sex and gambling, have led many researchers to suggest a similar link between the brain's reward system and music listening (Vuust & Kringelbach, 2010b). A challenge with fMRI studies is that one does not measure dopamine release directly, but rather changes in blood flow in dopamine-innervated brain areas. However, an interesting study combined fMRI with PET-scanning using the dopamine specific tracer [^{11}C] Raclopride and showed a functional dissociation between striatal dopamine release during the "wanting" and "liking" phases of musical pleasure (Salimpoor, Benovoy, Larcher, Dagher & Zatorre, 2011). In the "peak pleasure," in this case in music-induced chills, the dopamine release occurred mostly in the nucleus accumbens while the anticipation, "wanting," was associated with dopamine release in the caudate nucleus. While this study showed dopamine release in response to musical anticipation and pleasure, it should be kept in mind that the lack of temporal resolution of the PET scan could mean that dopamine may solely (or partly) be released in anticipation of pleasure, whereas other neurotransmitters such as opioids and endo-cannabioids could account for the "peak pleasure" activity (Stefano, Zhu, Cadet, Salamon & Mantione, 2004).

Are All Pleasures Alike?

While different pleasures can be separated into similar phases, they are perceived as different from each other. Listening to music, a good meal and sexual pleasure all appear to be linked to unique feeling states – eating a good meal does not feel the same as listening to a great concert. However, these differences in the subjective experience are not necessarily representative of the underlying neural mechanisms. Critics of brain research in music, such as Raymond Tallis, often seem to misunderstand this distinction, arguing that a "science that cannot tell the difference between the response to music, drugs and sex (. . .) says little about either" (Tallis, 2014, pp. 52–53). Hyperbole aside, neuroimaging studies does indeed suggest a shared or overlapping brain system responsible for reward processing, a reasonable proposition considering the eons of evolutionary pressure for efficiency that has shaped our nervous system. This overlap can be thought of as a "common currency" reward network, wherein various brain regions interact. Hence, even though the pleasure

of addictive drugs, food, sex, music, art and sustained states of happiness all produce partly similar patterns of brain activity, they also include specialised brain networks that contribute to the unique sensations elicited by differing pleasures (Kringelbach, Stein & Van Hartevelt, 2012). Furthermore, the effective connectivity in the networks may be quite different from one modality to another which can be targeted by novel analytical methods such as whole brain computational modelling (Deco, Tononi, Boly & Kringelbach, 2015; Kringelbach & Berridge, 2010c). Within that framework, music is an interesting and effective way of exploring the reward network.

Is Music only Associated with Positive Emotions and Pleasure?

When discussing music emotions and pleasure one might ask: What about music that is perceived as sad? Music is not always happy and upbeat, but often sombre, mournful or melancholic. Indeed, Juslin and Laukka (2004) find sadness to be the eighth most commonly reported emotion induced by music. It is, however, necessary to make a distinction between pleasurable or unpleasurable music and happy or sad music. In music and perhaps other forms of arts, sad and happy emotions are likely to coexist independent of pleasure or enjoyment. There are multiple theories explaining the existence of sad music, with most pointing toward both a societal and individual benefit of sad music (see Menninghaus et al. (2017) and Eerola and Taruffi & Koelsch in this *Companion*).

In psychopathological states such as depression and schizophrenia, there is evidence for a change in how one listens to music (Gebhardt & von Georgi, 2007). In an fMRI study where participants were assessed for depression, anxiety and neuroticism, decreased activity in the medial prefrontal cortex was found in males using music to match or enhance, existing emotions (Carlson et al., 2015). This suggests that music listening in certain instances may become maladaptive and possibly have a negative effect on mental health. It is, however, highly unlikely that particular kinds of music propagate mental disorders (see Kennaway in this *Companion*), but rather that conditions such as depression change the way that we experience music in general and thereby the neuronal processing of music.

Chills: A Case of Musical Pleasure

One of the difficulties in studying emotional responses to music is that these are individual and not stable in a listener during listening or even across several instances of listening to a musical piece. Due to the temporal nature of music it is necessary to investigate differences on a fast temporal basis when studying brain activity in response to music. One way to address this problem is to concentrate on the more stable emotional reactions to music, one of which is the so-called "chills." The sensation of chills is a particularly salient pleasure reaction from music. It denotes the sensation of shivers running up and down the spine, goose pimples and hair standing on end that can accompany especially delightful musical listening experiences. Psychologically, chills are related to the survival mechanisms of what has been called the four Fs of life ("fighting," "fleeing," "feeding," and "reproduction") and in particular to surprise. These fundamental responses involve both subcortical and cortical mechanisms and are fast and mostly automatic. As an example, the characteristics of the fight response are immediate, increased arousal and aggressive display, which is seen in the hair standing on end and should the slower appraisal response confirm a real danger, these can help the urge to fight. In the case of music, the subsequent appraisal process always determines that the event does not imply any real danger. This causes the feeling of shivers down the spine.

Surprise indicates a biological failure to predict future events. The chill effect thus becomes a response to a violation of musical expectations. According to Huron, the delight from the "chills" stem from a contrast between a negative "fast track" response (the reaction/prediction response) mediated by subcortical structures in the brain, which is substituted by an often positive "slower

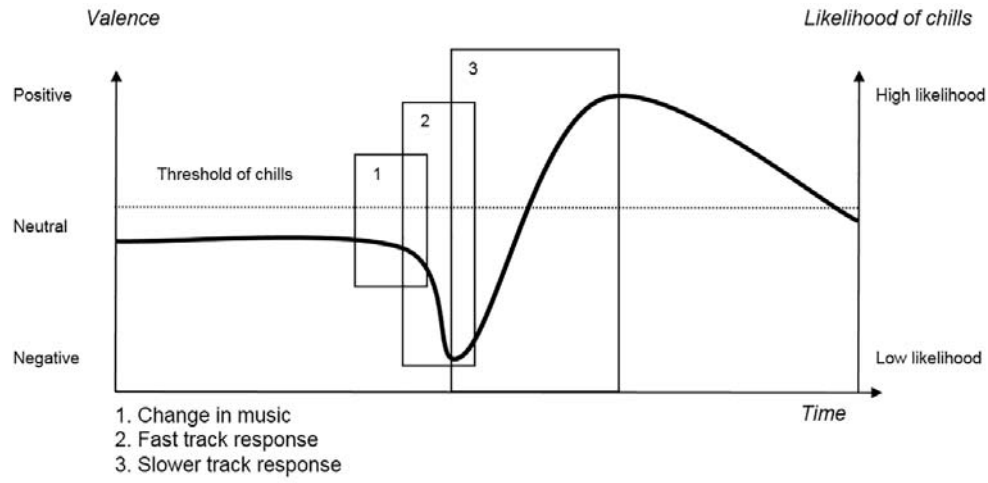

Figure 15.1 Musically induced chills

track" response (the appraisal response) mediated through cortical structures (Huron, 2006). This results in an overall positive feeling of pleasure. The chill response is therefore a much-desired quality of music (Figure 15.1). Since musical chills are fast survival-related responses, pointing to the involvement of evolutionary ancient brain structures and reported to be linked to the pleasure of music, it has been obvious to test the hypothesis that musical chills are associated with the reward system in the brain.

In an elegant study, Blood and Zatorre (2001) investigated chill responses in ten music students from the Department of Music at McGill University while scanning them with PET. Each of the participants chose a Classical piece of music that elicited strong emotions and chill experiences. These self-chosen pieces were then used as control situation for another participant. Participants reported chills that correlated with changes in the psychophysical measures during listening to their own pieces compared to the control pieces. Regression analysis assessing the relationship between increasing intensity ratings related to chills and PET measurements of regional changes in blood flow identified changes in brain structures involved in reward, motivation, emotion, arousal and pleasure. As with various types of pleasures, the experience of these chills varies significantly from person to person and not everybody is susceptible to experiencing them. Efforts to explore if and how, personality traits are connected to the experience of chills has provided conflicting results (Nusbaum & Silvia, 2011; Rickard, 2004). Still, musical chills remain a highly interesting avenue for understanding how music affects our reward system.

The Pleasure of Groove

Certain types of music can induce a strong desire to move. It can be a careful tapping of a finger or the explosive action seen on a busy dance floor. Synchronising motor action to a beat is a highly conspicuous expression of musically induced pleasure and has received significant empirical support (Barret & Lindquist, 2008; Niedenthal, 2007). However, the connection between music and the desire for bodily movement is still in need of exploration (For the history of this debate, see Kennaway in this *Companion*).

The quality of music that is most likely to induce this need to move is in contemporary music referred to as "groove," and is characterised by syncopation (Greenwald, 2002). Syncopation can

be thought of as a slight deviance from the regular rhythmic flow of music and is commonly found in musical genres such as hip-hop, EDM, funk, soul and jazz, but also in traditional folk music and Classical music. Considering pleasure and emotional responses to music as relying on anticipation and prediction, there is evidence that the sensation of groove relies on the same mechanisms.

In 2011 Keller and Schubert (2011) showed that melodies which violate rhythmic expectations were rated as more enjoyable than rhythmically predictable melodies. This suggests that rhythmic complexity is a factor in understanding why people enjoy listening to music. In addition, the more people experience a desire to move to music, the more they enjoy it (Janata, Tomic & Haberman, 2012). The ability to gain pleasure from moving in relation to music seems therefore to be important for our liking of music. Our ability to perceive regularity in rhythm, even when the rhythm itself is not uniformly regular, relies on the mechanism of metre perception. Metre, a construct of regularly alternating strong and weak accents that forms nested levels of isochronous pulses, is perceived according to a predictive model. Thus, when syncopation is introduced, the rhythmic components differ from the anticipated rhythm and a prediction error is formed. However, the perception of groove seems to be dependent on the amount of deviance in the syncopation.

The inverted U-shaped curve is ubiquitous when it comes to pleasure. Neither too little nor too much reward brings the most pleasure, but this is found instead at an optimal, balanced amount related to the current state. An increase in complexity correlates positively with liking, arousal and pleasure, but only up to an optimal point, after which further increase in complexity reverses the effect. This is demonstrated in general for both art and music (Berlyne, 1971; Heyduk, 1975). A recent study using a range of drum-breaks ranging from weakly syncopated to very syncopated, confirmed a similar curve in the relation between sensation of groove and amount of syncopation (see Figure 15.2) (Witek et al., 2014). As experience affects low-level responses to rhythmic discrepancies, there could be differences in culture-specific responses to syncopation (Vuust, Ostergaard, Pallesen, Bailey & Roepstorff, 2009). However, as syncopation can be thought of as a shift in rhythmic emphasis, it can exist in any type of rhythmical structure. While the recent groove study recruited participants from all the major continents, the question of culture-specific responses is still open, but broadly speaking, listeners appear to prefer medium degrees of syncopation in groove.

In contrast to musically induced chills, groove would appear to be a more stable experience existing on a sustained level, that wax and wane with syncopation (see Figure 15.3). This could be a result of the prediction error caused by syncopation, with the urge for body movement possibly a mechanism for maintaining the original anticipated rhythmic continuum. For future studies into the pleasures of groove, the temporal structure of the movements that groove elicits, in comparison to the deviance of the syncopations forming the sensation of groove, would be an interesting way of exploring predictive coding within the intersection of music and movement.

Figure 15.2 The effect of a grooves' degree of syncopation on the experiences of wanting and liking

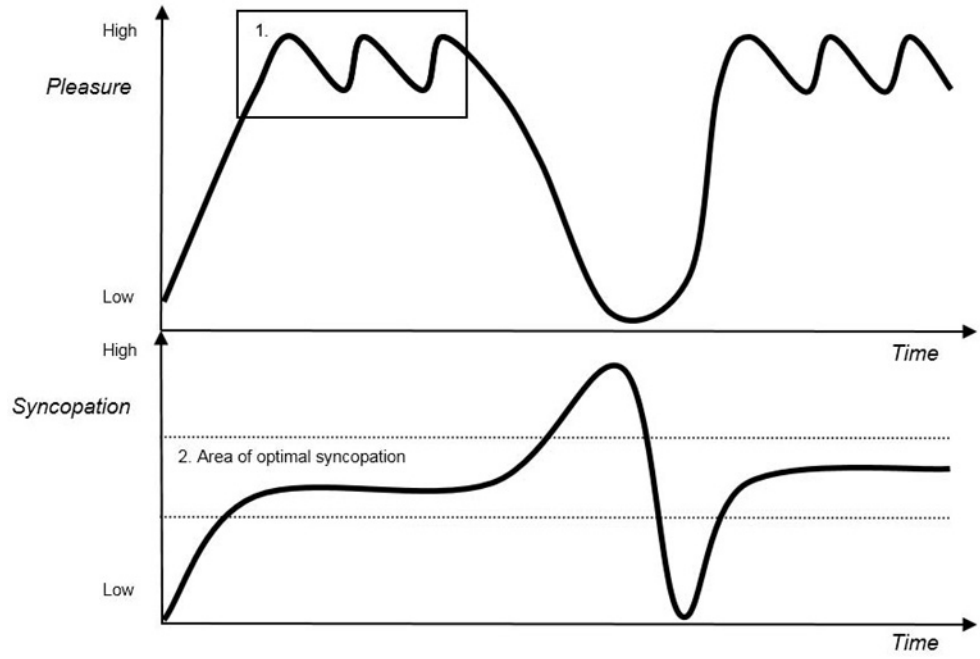

Figure 15.3 Pleasure of groove

Music, Anhedonia and Well-being

A relatively new field of research is the discovery that some people display so-called music anhedonia (Satoh, Nakase, Nagata & Tomimoto, 2011). Anhedonia refers to the loss of enjoyment in previously pleasurable activities (Rømer Thomsen, Whybrow & Kringelbach, 2015). It is a key symptom of many affective disorders and is clearly linked to changes in the balance of brain reward-processing regions (Harvey, Pruessner, Czechowska & Lepage, 2007). In an fMRI experiment performed by Osuch et al. (2009), brain activation in response to favourite music in healthy people was compared to that among depressed patients. While both groups of participants reported enjoying their favourite music more than neutral music, there were significant differences in reward processing activation. The depressed group exhibited a lower activation of nucleus accumbens and the medial orbital frontal cortex, signifying a disruption of cognitive functioning in depression.

While clinical depression can be debilitating for its sufferers, it allows an insight into how musical perception and musical pleasure is interconnected. In a study by Chan, Wong and Thayala (2011), music was used to effectively reduce the symptoms of depression, by having patients listen to their own choice of music. Hopefully, further insight into how our reward system functions could lead to better interventions for patients suffering from disorders affecting the reward system.

Music is not only a source of pleasure but also seems to be linked to well-being more generally. As originally proposed by Aristotle, happiness can be thought of as consisting of at least two aspects: *hedonia* (pleasure) and *eudaimonia* (happiness or a life well lived) (Berridge & Kringelbach, 2011; Pelosi in this *Companion*). Happiness cannot be reduced to pleasure alone and pleasure is but a fleeting moment in the state of happiness. While we have made important strides in identifying the brain regions involved in pleasure, the brain states underlying eudaimonia are much less well understood. To study happiness from a purely empirical point of view is difficult given that it is not

easy to consistently evoke states of well-being with sensory pleasures such as food. Yet, music could provide exactly such tools for studying eudaimonia and groove music for instance elicits long lasting states linking music and dance to deeply meaningful experiences that may yet offer new insights into the brain mechanisms of happiness.

Music and Neuroscience

The neuroscience of music is, despite its prolificacy, a fairly new field. While theories pondering how we understand, perceive and create music probably predate Classical Antiquity, brain imaging methods offering a view into the function brain has only existed for around 40 years. There are vocal critics of a brain-focused approach to understanding music, ranging from philosophical opposition to technological scepticism (Scruton, 2014; Tallis, 2014). And indeed, there are limitations to the current field of neuroscience, some of these stemming from the decomposition of the musical stimulus which is necessitated by most of the cognitive methods involved. The experience of music is not solely the isolated experience of tempo, rhythm, pitch and harmony, but rather an amalgamation of factors depending on mood, context and experience, to mention just a few. However, by understanding how our brain perceives the building blocks of music, we are able to form testable hypotheses that contribute to understanding music as a human phenomenon. Without meticulously building a theory of music based on empirical, reproducible findings in line with how our brain works on a neuronal level, music will remain as elusive as some critics might want it to be. It should be kept in mind that we create, perceive and understand music on a biological foundation and therefore any attempt at understanding the why and how of music must include a biological component.

Conclusions

In summary, we have reviewed the literature on the pleasure derived from music and in particular the role of rhythm. The evidence shows that anticipation and prediction would appear to be at the root of both, how the brain processes information in general and how music becomes pleasurable and affects emotion. This point becomes clear when considering music from the viewpoint of music theory which shows that predictive structures are found in all possible layers of musical structure. On a fundamental level, simple acoustic patterns act as the building blocks of hierarchical anticipatory patterns of melody, harmony and rhythm. These structures vary in complexity, being established, confirmed, delayed or violated in order to construct what we perceive as music. Within this cycle lies the ability of music to influence pleasure, more complex emotions and even well-being (eudaimonia).

The perhaps most promising aspect of music is the case of groove, which links music, rhythm and dance; here the pleasure is extended and is not just the build-up to a climax. The enjoyable sense of groove lies within a constant slight deviation from predicted rhythmic congruity and is a prolonged state of well-being. In addition, if dopamine works as an instigator for undertaking potentially pleasurable activity, musical groove can act as a tool for investigating dopamine's role in the reward networks of the brain. We showed how this is different from musically-induced chills which are linked specifically to peaks of pleasure, wherein anticipation and tension created within the structure of the music influences the often short-lived experience.

Hence music exists, we believe, if not as a result then at least as a function of the predictive abilities of our brain, our sociability, and our ability to learn from others and from experience. Music also engages reward networks in our brain, and these networks may perhaps be the prime motivator for partaking in the activities necessary for securing the future of our species. As such, music could perhaps be considered a distillation of our cognitive abilities.

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16

THREE CONTROVERSIES OF MUSIC AND EMOTIONS

Neuroscience and the Psychology of Sadness and Music

Tuomas Eerola

Introduction

The past decade has witnessed an unprecedented growth in neuroscientific research in general, including work on affective processes related to music. This chapter summarises the current state of research in psychology and neuroscience of music-related emotions by examining one particularly problematic yet common emotion, sadness, using three controversial yet eminent theoretical constructs from the field of affective sciences.

The first construct relates to theories of affect dimensions where variations in emotions are considered to consist of gradual differences in dimensions such as pleasure–displeasure, arousal–calming and tension–relaxation. These three dimensions were initially proposed by the late nineteenth-century psychologists Wilhelm Wundt and Edward Titchener. The two initial dimensions, typically labelled as valence and arousal, were made immensely popular in the 1980s by James Russell and David Watson after Charles Osgood's pioneering work on affective meaning of words in the 1950s. These dimensions have been the dominant structure applied to the study of emotions expressed and induced by music, yet they struggle to characterise sadness in music, for instance, as it fails to conform to the negative polarity of the valence dimension, since in the context of music the feeling of sadness is not unpleasant and negative but rather positive. This in turn is indicative of wider problems related to appraisal and aesthetics.

The second controversial construct is aesthetic emotion. Since the beginning of psychology as a discipline, it has been acknowledged that survival-orientated basic emotions may not adequately characterise emotional experiences induced by aesthetic objects and contexts. Despite several recent surges of interest in formulating aesthetic emotions in other terms, including "awe," "interest" and specific music-induced emotions, adequate and reliable measurement of such experiences in relation to music have been a genuine challenge for neuroscience and psychology (Keltner & Haidt, 2003; Silvia, 2005; Zentner, Grandjean & Scherer, 2008). Music-induced sadness is an excellent exemplar of this controversy due to its associations with beauty and aesthetic experiences.

The third controversy relates to the awkward role of the body in music and neuroscience. When description of emotion processing is based on cognitive mechanisms and underlying brain areas, there is a danger of considering emotions as disembodied and somehow separate from the body and

the environment. While the appraisal theory of emotions of Klaus Scherer brings this situation and its evaluation into focus, it does not alleviate the problem of the neglected body. An embodied conceptualisation of the emotions would incorporate interactions between neural, physiological and endocrine systems as well as the external world and conceptual thinking (e.g., metaphors and image schemas), yet these elements have rarely been employed to explain emotions such as sadness in music.

The three controversial constructs outlined here are not only recent challenges for research on music, mind and emotion, but they reflect the history of affective science in general. Before examining each of these constructs in more detail, a short summary of the central issues in contemporary research on music and emotions is given.

Affective Sciences, Music and Paradoxical Sadness

While the empirical study of emotions has been proceeding now for more than a hundred years, its rise in popularity has coincided with the cognitive paradigm loosening its grip on the range of permitted topics. Up until the 1980s, emotions were often thought to be maladaptive since they interfere with decision-making and rational thinking. Since then, however, topics such as emotions were able to flourish and the 1990s witnessed a frenzy of activity when influential neuroscientists such as Antonio Damasio and Joseph LeDoux outlined their seminal theories of emotions (Damasio, 1994; LeDoux, 1996). Novel neuroscientific methods as well as better understanding of the neuro-chemical systems involved in emotions have hastened the progress by which causal explanations between brain states, neural architecture, behaviours and experiences have been made. Emotions have taken an important place in psychology, despite difficulties in establishing a consensus on what constitutes an emotion, how many emotions can be said to exist and how such emotions are structured (e.g., Isard, 2009; Niedenthal & Brauer, 2012). Despite on-going debates regarding the structure of emotions, most scholars in affective sciences agree on the components of emotions. These include (1) appraisal, (2) expression, (3) autonomic reaction, (4) action tendency and (5) feeling, all of which occur more or less simultaneously (Sander, 2013). The components occur within conceptually different yet interconnected domains: physiology (changes in brain, endocrine and autonomic nervous system states), psychology (functions, appraisal or recognition processes) and phenomenology (emotions as subjective experiences). These domains require different approaches to measuring and capturing the essence of the emotions examined. A broad summary of the scope

Table 16.1 Overview of the different domains, models and components in emotion research

Domain	*Model*	*Focus*	*Components*	*Measures*
Phenomenology	Complex /Aesthetic	Experience	Feeling	Self-report (scales, narratives, qualia)
Psychology	Discrete	Recognition	Expression, Action tendency, Appraisal	Behaviours (posture, expression, voice, movement) Self-reports (scales, forced-choice tasks)
Physiology	Dimensions	Core affects	Autonomic reaction	Peripheral (skin conductance, heart-rate, temperature, muscle tension, respiration), hormonal (e.g., cortisol, prolactin, interleukins, oxytocin), and neural (electric, magnetic and haemodynamic indicators) measures

of research, defined through domains, models, focuses, components and measures from neurochemistry to introspection is given in Table 16.1.

While Table 16.1 is a reduction of the elements involved in emotion research, it is useful at this point in the discussion, as it provides a broad road map for the models, components and measures in the affective sciences, divisions that may also be seen in the field of music and emotions. To understand the current state of the affective sciences and the puzzles concerning musical emotions, I will first elaborate on the theoretical ideas embedded in emotion models and then explain the measures typically used to capture the emotions according to the models.

What Emotions are Measured?

The most widely known way to organise emotions in affective sciences is to assume that the emotions are discrete categories, also referred to as "basic," "primary" or even "fundamental" emotions. Theories of discrete emotions assume that all emotions can be derived from a limited set of innate and thus universal basic emotions, such as *fear, anger, disgust, sadness* and *surprise* (see Matsumoto & Ekman, 2009). The actual number of categories and labels assigned is still a source of debate, but the basic emotion model has gathered support from neural, cross-cultural, developmental and physiological research spanning four decades (Sander, 2013). Notwithstanding this success, doubts about the explanatory power of such categories have been raised, since, for example, brain imaging studies have not yet delivered results consistent with innate and distinct emotion categories (Vytal & Hamann, 2010). This failure may not only be a problem of pinpointing the exact brain areas responsible, but a more fundamental conceptual issue as advocated by Raymond Tallis and William Uttal, the latter reminding us that the interpretation of the neural activation maps relies heavily on projection of historical and philosophical concepts and has the danger of resuscitating phrenology (Tallis, 2013; Uttal, 2001). Though such a reminder is helpful, it is prudent to acknowledge in general that mental functions are composed of multiple sub-components that can be localised to specific brain regions. The debate only questions whether sub-components related to emotions can be localised at the level of concepts such as basic emotions.

Throughout the history of affective sciences, music has been a topic of interest for psychologists, even before specialised music psychologists took hold of the topic in the 1990s. And of course, the discussion of music and emotion has much deeper roots (see e.g. Cook & Dibben, 2010 and chapters 1 to 11 in this *Companion*). The originators of contemporary psychology, such as Wilhelm Wundt and Hermann von Helmholtz, all had research interests in music. Wundt attempted to explain spontaneous emotional calls and rhythm as elicitors of emotions in music, while Helmholtz unravelled many key aspects of psychoacoustics (Helmholtz, 1863/1954; Wundt, 1897, p. 170; 1900/1920). It took until the 1930s, however, for music's emotional code to be subjected to systematic study. In a series of empirical experiments, Kate Hevner arranged for a professional pianist to perform extracts from classical piano pieces, carefully chosen to express different emotions (Hevner, 1935). In this and later experiments, she manipulated the mode, tempo, pitch, and melody and rhythm of the pieces to explore how these features affected the adjectives chosen by sophomore students to describe the music (Hevner, 1935, 1936, 1938).

These seminal studies revealed that (1) certain adjectives can be consistently used to describe the emotions expressed by music, (2) these emotions can be arranged in a circular layout to preserve their interrelationships (see Figure 16.1) and (3) there is a systematic mapping between emotions and musical features (also shown in Figure 16.1). It is worth mentioning that through her arrangement of experimentally obtained materials, Hevner, in effect, proposed a circular structure of emotions 50 years before such a model was postulated in psychology by James Russell (1980, see Figure 16.2). The other major implication of Hevner's work was that particular emotions are intimately connected to musical features. Her results regarding sadness suggested that this emotion is best achieved

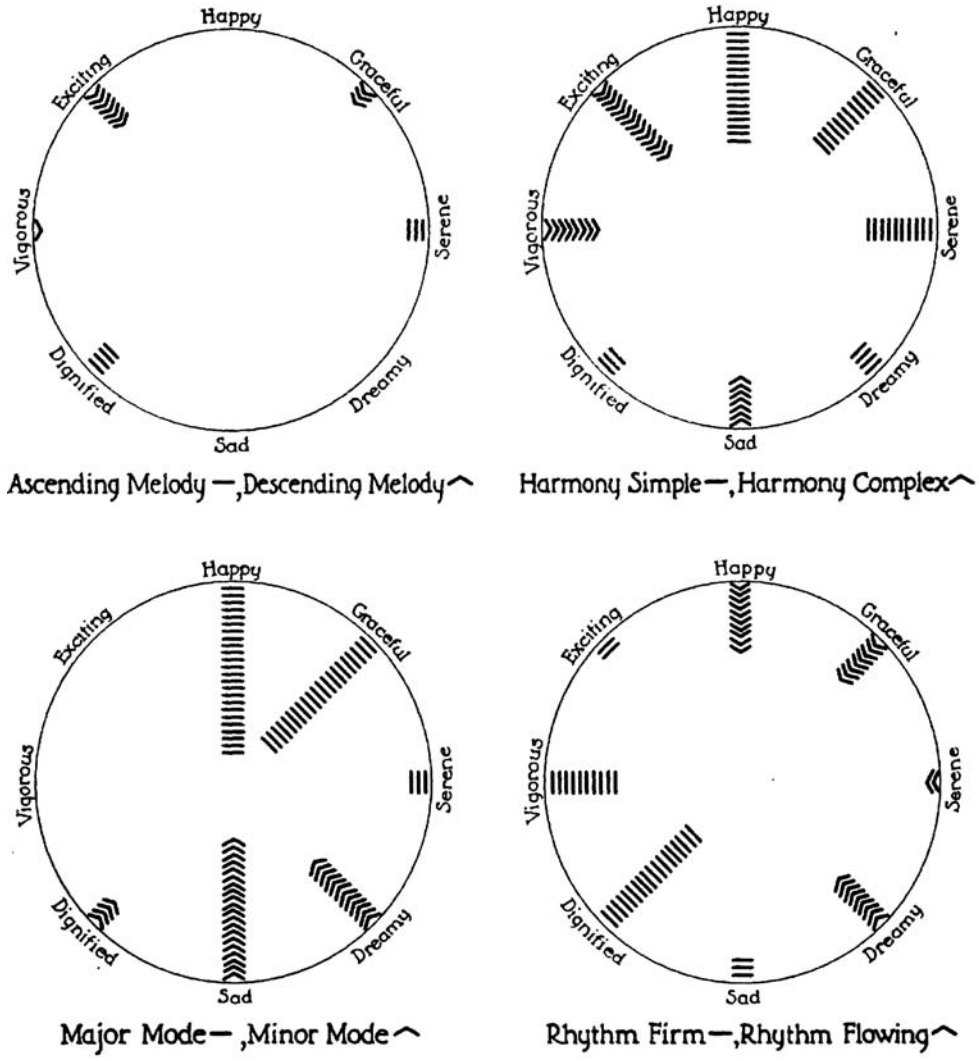

Figure 16.1 Images presenting the circular arrangement of emotions and the contribution of individual musical features to the emotions (Hevner, 1938, p. 265)

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through minor mode, slow tempo, low pitch, firm rhythm and complex harmony (Hevner, 1937, p. 626). Contemporary research has not changed this scheme; Alf Gabrielsson's recent summary of all empirical studies presented a very similar recipe for portraying sadness in music (Gabrielsson & Lindström, 2010). Recent studies have contributed advances that enable more features to be extracted from music, as well as ways to carry out experiments envisaged by Hevner in a more controlled fashion, but the results have remained similar (Eerola, 2011; Eerola, Friberg & Bresin, 2013).

In the psychology of music, emotions received only minor attention until the 1960s and early 1970s, when interest in charting emotions and musical features was rekindled (Gabrielsson, 1973; Wedin, 1972). These scholars updated knowledge on the structure of emotions expressed by music

by asking listeners to provide free verbal reports and adjective choices for emotions represented by music examples. This research aimed to formulate robust emotion taxonomies designed specifically for music, an approach that even now divides opinion, as we will see in the next section devoted to aesthetic emotions. In these early studies, listeners were either instructed to describe music examples in emotional terms (e.g., this music is sad) or state what the music might have been expressing (e.g., this music expresses sadness). However, after the turn of the millennium, the emphasis shifted toward explorations of how music makes the listeners feel (see Eerola & Vuoskoski, 2012). Empirical evidence suggests that the distinction between emotion induction and recognition should be characterised as a question of intensity rather than involving completely different processes (Hunter, Schellenberg & Schimmack, 2008). The structures of emotions that have emerged from many years of music psychology studies are in fact those advocated in psychology; in music, almost half of the studies focusing on experienced emotions have resorted to basic emotions while those remaining have employed dimensional emotion models (Eerola & Vuoskoski, 2012).

How Emotions are Measured

Broadly speaking, emotions can be measured via self-reports, peripheral and neural responses, actions and behaviours (such as movement patterns, vocal characteristics and facial expressions) and even from biases to cognitive processes. Most of the research on music and emotions relies on standardised self-report measures, which include emotion labels and scales for indicating the degree to which a given emotion is expressed in music or how strongly the participant feels the emotion (see Zentner & Eerola, 2010 for a review of the measures). Whilst the purpose of the standardised instruments is to provide information about the experienced or perceived emotions in a reliable and transparent fashion, they, like their precursor, introspection, which was popular in the nineteenth century, are subject to caveats and limitations. Such limitations often relate to the confusion between perceived and experienced emotions, which can be difficult to dissociate or more generally to the demand characteristics of self-report methods, in which participants feel pressure to comply with any inferred outcome of the study.

While the standardised measures are convenient and more or less reliable if utilised properly, they do make strong assumptions of the potential emotional experiences since the act of offering scales naturally dictates the kinds of emotional experiences that can be reported. For this reason, it might be prudent to examine emotions with open responses as well, through interviews or non-verbal measures such as similarity ratings (Bigand, Vieillard, Madurell, Marozeau & Dacquet, 2005). Such studies have occasionally contributed insights that have not previously been captured using standardised instruments.

Another way to qualify experienced emotions is to collect peripheral measures such as skin conductance response, heart rate variability, respiration, facial electromyography and temperature, which have become increasingly common in studies on experienced emotions in music (Juslin, Harmat & Eerola, 2013). These indicators are well established in terms of the underlying physiology as well as the way in which specific emotions affect the indicators of autonomic nervous activity (reviewed by Hodges, 2010). However, physiological measures are not always sufficiently sensitive for the emotional experiences being examined. For example, it is easy to discriminate low and high arousal emotions but much more challenging to disambiguate between various low arousal emotions inducing tenderness, sadness or nothing (i.e., lack of induction).

Recording electrical and hemodynamic states in the brain has become increasingly common in emotion studies. The purpose in such studies is often not to verify the emotions experienced or perceived, but rather to pinpoint when and where processing take place. In this area, EEG (electroencelography), MEG (magnetic encelography) and fMRI (functional Magnetic Resonance Imaging) are the key techniques, with EEG and MEG indicating electric activity of the brain cells

while fMRI indexes blood-flow and blood oxygen-levels, both of which correlate with the underlying brain activity. fMRI has high accuracy in locating the changes in hemodynamics but is rather imprecise in timing. Consequently, fMRI studies have revealed which areas are involved in emotion experiences and perceived emotions, in terms of stimulus valence (Blood & Zatorre, 2001; Flores-Gutiérrez et al., 2007; Koelsch, Vu, Müller, Friederici & Fritz, 2006; Schmidt & Trainor, 2001). It is worth noting that activity itself in certain parts of the brain is not meaningful since the brain is a constantly active system. In order to pinpoint the relevant brain areas, neuroscience studies subtract areas activated in a control task from areas activated in a music listening task, in the hope of leaving only the changes attributed to the music listening task intact. Such comparisons, however, need to be carefully constructed in terms of motor activations, memories and overall task compatibility. Learning where emotional information is processed is not the final goal of neuroscience, as the real insights come from functional explanations of what each area of the brain area is responsible for and what the mechanism behind the emotion is.

In summary, peripheral and neural indicators of emotions have a tremendous capacity to link experiences with functional architecture of brain and physiology that is designed to regulate the emotions. However, the studies to date do not yet paint a consistent picture of the processes involved, since there are several mechanisms, technical issues and interactions between the processes that need to be better understood. There is also the issue of how to properly connect the domains involved: experiential, psychological and physiological. It may be safe to assume that most challenges in emotion and music research involve forming meaningful connections between physiology and experiences, since the scope of possible mechanisms is immense.

Having given a general summary of the central topics and methods in affective sciences, the next three sections will present three influential notions in emotion research and discuss the challenges within these. In each case, emotions induced by sad music will be used as a concrete example. Sadness in the context of music illustrates well the basic components and issues of affective sciences such as affect dimensions and utilitarian versus aesthetic emotions. We will start the discussion of the challenges with the models of emotions and then move onto aesthetic emotions, before finally discussing the role of the body in experiencing emotions.

Affect Dimensions

The British philosopher Jeremy Bentham, founder of modern utilitarianism, proposed in 1776 that our decisions are based on maximising pleasure and minimising displeasure. Later on, similar thoughts appeared across nineteenth-century psychology although the details of the ideas were often different (e.g., Meinong, 1894; Reisenzein, 2015, p. 29). At the end of the nineteenth century, the founding father of the discipline of psychology Wilhelm Wundt similarly put forward an idea that had dimension of pleasure at its core, but he also added other dimensions such as inhibition (*Beruhigung*) and tension (*Spannung*) to solve the apparent lack of differentiation between emotional states (Wundt, 1897, 1905). Although the actual number of dimensions and their labelling have been contested ever since, a great deal of support has been given to the notion of the dimensions as such. By the end of the 1950s, Charles Osgood had already demonstrated how most linguistic and non-linguistic emotion concepts could be located in a three-dimensional space, labelled valence, activation and power or potency (Osgood, 1957).

The dimensional model became pervasive in affective sciences after a two-dimensional, *affective circumplex* model of emotions was postulated by James Russell in 1980. This model assigns emotions as combinations of two dimensions, valence (positive versus negative or sometimes pleasantness versus unpleasantness) and arousal (activated versus deactivated), that represent two orthogonally situated continuums in the affective space (see Figure 16.2). It is possible to project almost any affect term onto the two-dimensional space, as shown in Figure 16.2 for a number of affect terms in

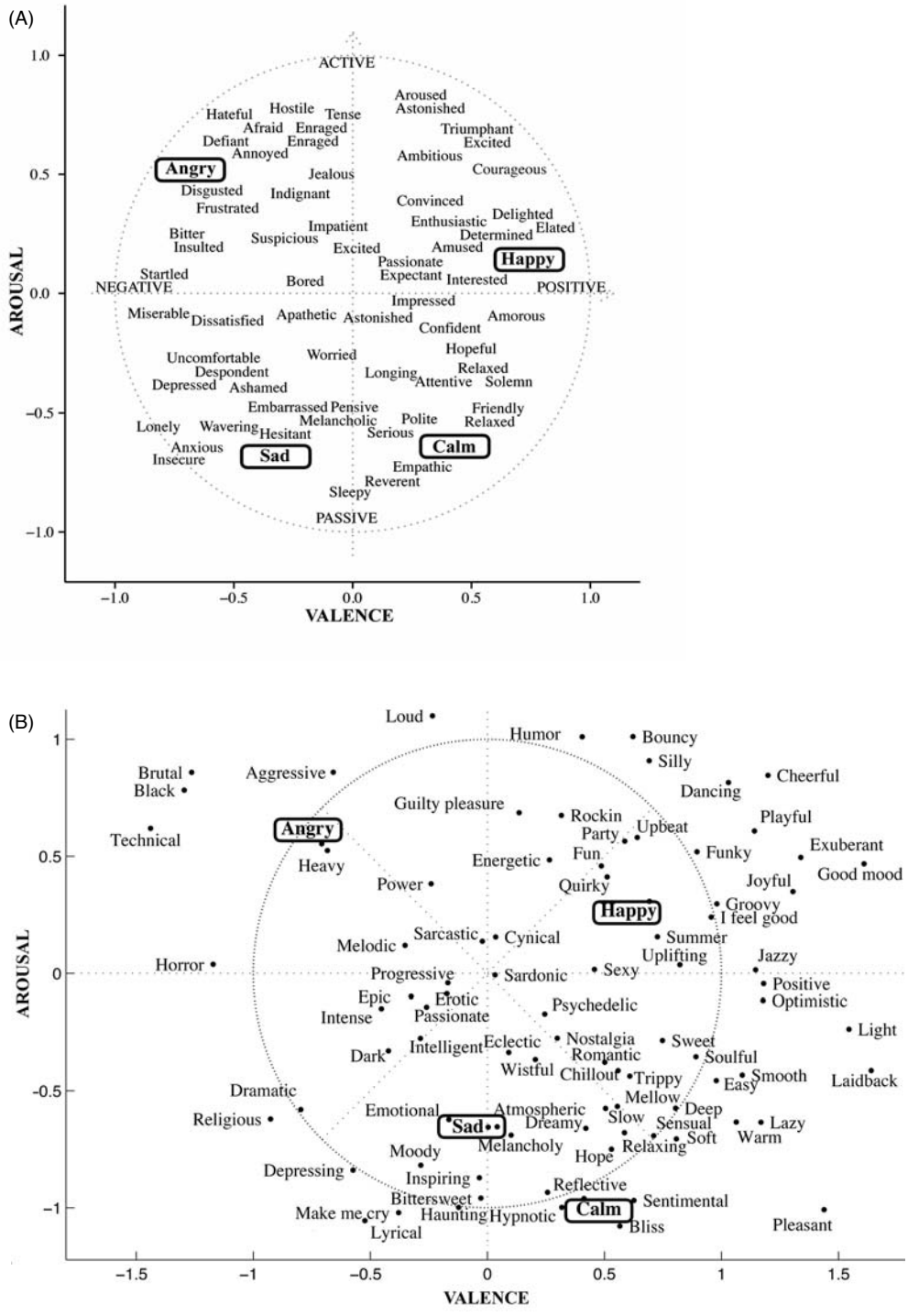

Figure 16.2 The affective circumplex model based on (A) ratings of the emotion terms (Russell, 1980), (B) emotion-related tags in 118,874 tracks in Last.fm projected to affective circumplex space
Source: Saari et al., 2015, reproduced with permission from IEEE

general and for affect terms derived from a large collection of music tagged by millions of users (Russell, 1980; Saari, Eerola, Barthet, Fazekas & Lartillot, 2015). It might be worth pointing out that whilst the term "sad" is clearly on the negative side of valence dimension in everyday emotions, in music it lies in the middle.

Another way of talking about the functional architecture behind dimensions has been to connect them to fundamental behaviours at all levels of phylogeny, namely approach and avoidance-related behaviours (Davidson & Irwin, 1999). The affective circumplex model has received support in numerous studies of self-reported emotions, including cross-cultural comparisons and psychometric studies (Barrett & Russell, 1999; Posner, Russell & Peterson, 2005; Russell, 1983). It has therefore been used in a large number of emotion studies in psychology, including those on music (Eerola & Vuoskoski, 2012).

Despite the popularity and apparent elegance of the affective circumplex model, it has at least three shortcomings worth noting, (1) poor emotion discrimination, (2) unclear physiological substrates and (3) lack of emotion mixtures. Relating to the first of these, the affective circumplex model places emotions that are intuitively regarded as dissimilar, such as anger and fear, in close proximity in the circumplex space. Both of these emotions are negatively valenced and highly active, but this does not make them similar emotions (Scherer, Johnstone & Klasmeyer, 2003). One way of solving the apparent lack of distinction in the affective circumplex model is to constrain descriptors to primitive aspects of emotion.

A recent reformulation of the dimensions as *core affects* by James Russell and Lisa Feldman Barrett presents the idea that such dimensional affects arise from the core of the body and in neural representations of body states that are "simple primitive non-reflecting feeling most evident in mood and emotion but always available to consciousness" (Russell & Barrett, 2009, p. 104). Rather than being full-blown emotions, these are free-floating affects that are not about something. When core affects are interpreted and causes for the emotions are found, the experience is better verbalised and explained using higher level concepts, for example, those related to the basic emotions (*sad, happy, angry, scared, disgusted*, etc.). Bringing antecedents and appraisals of emotions into play to solve the problems of dimensions is not a novel concept and the hybrid model of emotion proposed by Lisa Feldman Barrett is a recent example of this approach, more fully explored at the end of our next section (Barrett, 2006; Lazarus, 1991; Oatley & Johnson-Laird, 1987).

A second criticism regarding the affective circumplex model is that the axes do not necessarily correspond to the underlying physiological systems that are assumed to be responsible for affective experience. Several solutions to this problem have been offered. Thayer postulates a variant of the circumplex model, which rotates the axes in a way that eliminates the single arousal dimension while offering energetic arousal and tense arousal (Thayer, 1989). As far as music is concerned, few studies have explicitly observed that valence and arousal dimensions are unable to account for all variance in emotion aroused (e.g. Bigand et al., 2005; Ilie & Thompson, 2006).

The third criticism for any dimensional model is that emotions may occasionally be ambivalent (Schimmack & Colcombe, 2007). It is perfectly viable to feel simultaneously happy and sad. Indeed, empirical experiments using tragicomic films or music with both happy and sad cues seem to suggest that people experience mixtures of emotions (Hunter et al., 2008; Larsen, McGraw & Cacioppo, 2001). Such findings are inherently problematic for the affective circumplex model since it posits that valence for instance is irreducible and thus people simply cannot feel happy and sad at the same time. A number of experiments using simultaneously presented unpleasant and pleasant pictures or amusing and disgusting film clips have suggested that a way to reconcile this dilemma is to assume that mixed emotions are the result of rapid switching between alternative foci within different points in the dimensions, although support for this notion has not yet been found (Hemenover & Schimmack, 2007; Larsen & McGraw, 2011; Schimmack & Colcombe, 2007).

The particular case of sad emotion associated with music provides examples of all three types of criticisms aimed at the affective circumplex model discussed above. Firstly, the emotion itself should be negatively valenced, but all empirical studies demonstrate that experiences related to sad music are typically not negatively valenced (Garrido & Schubert, 2011; Vuoskoski & Eerola, 2011). Secondly, in terms of the underlying physiology, low arousal emotions such as sadness are inherently more difficult to discriminate from other low arousal emotions such as tenderness or peacefulness, although sad emotions induced by music have been successfully distinguished from other emotions using skin conductance level, temperature and heart rate (Juslin et al., 2013). This does not, however, provide any answers to the physiological substrates of the affective circumplex model. Interestingly, when sadness induced by music is regarded as a non-negative emotion, it still generates negative bias to cognitive process that is akin to those created by genuine sadness such as the ones induced by autobiographical memories (Vuoskoski & Eerola, 2012). Does this make sadness in music an inherently mixed emotion and hence provide supporting evidence for the final, third criticism of the affective circumplex model? Although this is not necessarily the case, sad music does lead more often to mixed and bittersweet emotions than is the case with other music types (Hunter, Schellenberg & Griffith, 2011).

Aesthetic Emotions

The concept of aesthetic emotions has an esteemed past with philosophers and thinkers including Plato, Plotinus, Leonardo da Vinci, Dürer and Kant all expressing ideas in which the experience of beauty is regarded as an emotion, albeit using different terminology (e.g., the language of passions). In the seventeenth century, the constituent elements of emotions were made explicit through formal codifications, such as the classification of facial expressions of passions by Leon Battista Alberti and Charles le Brun and the expressive devices used to portray each emotion through music in the Baroque *Affektenlehre* (Mattheson, 1739). The latter, also known as the doctrine of the affections, provided composers with a guide for how to convey dozens of affects. For instance, sorrow should be "portrayed with a slow-moving, listless melody frequently broken with musical 'sighs'" (Buelow, 2007, pp. 401–402). It must be said that these rhetoric devices were not necessarily widespread in the Baroque era; in addition, they were meant to decorate and elaborate the overall drama of the piece, not individual phrases. However, many similar affective connotations have reappeared in new guises across the years, even in the contemporary cataloguing of emotional cues in music, not because of the eminence of Mattheson's initial writings as Wilson et al. suggest, but more likely due to underlying similarities between the physiological states related to emotions and the manner in which they can be expressed (Wilson, Buelow & Hoyt, 2001). For instance, contemporary research on musical devices expressing sadness has painted a picture not entirely dissimilar to Mattheson's characterisations; the expression of sadness in music is described as being achieved through cues such as slow tempo, lower pitch and dark timbre (Eerola et al., 2013; Huron, 2011; Post & Huron, 2009. See Quiñones in this *Companion* for a discussion of early twentieth-century parallels). In such observations, the origins of links between cues and affects are assumed to reside in physiology and embodiment, more on which will be discussed in the next section. This is yet another demonstration of how historical accounts and contemporary approaches do often draw fascinating parallels despite the differences in fundamental concepts, terms and the scope of the work.

The literature on the formal associations between emotions and artistic expression in the seventeenth to the twentieth century eschewed explanation of such emotions as similar to everyday emotions. A case was made that aesthetic emotions are not secondary and "adjunct to the serious business of survival," but rather are valuable and pleasurable for their own sake (Clay, 1908, p. 283).

In contemporary psychology, the main distinction between everyday emotions (sometimes called utilitarian emotions) and aesthetic emotions lies in the apparent lack of cognitive appraisal in

aesthetic emotions. Emotions engendered through any art form are merely expressed emotions; since these objects consist purely of "make-believe," there are no direct material effects on the physical or psychological well-being of the individual experiencing them, which is not the case in events engendering emotions in everyday situations. Therefore, when people engage with artworks or objects in nature, even though the emotional experiences arising may simulate everyday emotions (e.g., fear, sadness or happiness), such experiences are not easily explained using the dimensions or discrete emotions designed to expound utilitarian emotions (Robinson, 2009). This reasoning has led some scholars to consider emotions induced by music or any other art form, as inherently different from utilitarian emotions. The difference between the two types of emotions could be characterised by seeing aesthetic emotions as more reflective, pleasurable and possibly more complex. A similar argument has been proposed for other complex emotions such as moral and social (e.g., shame, envy, jealousy, schadenfreude, pity, etc.) and also epistemic emotions (e.g., interest, confusion, surprise) (see Sander, 2013).

It has also been argued that non-utilitarian emotions are more subject to cultural and social interpretations than is the case with basic and dimensional emotions (Tsai, Knutson & Fung, 2006). For this reason they have also been mentioned as particularly important objects of study as they are thought to be uniquely human (Ortony, 1988). However, the question of whether such complex, non-utilitarian emotions adopted to the fringes of affective sciences may be considered either indistinguishable from aesthetic emotions or instead form a separate group of non-utilitarian emotions has not been solved adequately.

The subject of complex emotions in music has been approached in musicological writing, although empirical efforts in this field started fairly late (Bennett, 1942; Cooke, 1959). In 1985 Edward Asmus carried out a large-scale study (n = 2057) of the affect terms relevant for music and proposed nine dimensions of affects to account for the full range of emotion states (*evil, sensual, potency, humour, pastoral, longing, depression, sedative* and *activity*). Marcel Zentner and his colleagues provided the most recent and convincing account of music-related aesthetic emotions in which they carried out a series of empirical studies using a comprehensive list of emotion terms relevant to music (Zentner et al., 2008). The terms were reduced into nine emotion factors, a model which is now known as GEMS (*Geneva Emotional Music Scale*). This model contains factors particularly appropriate for contemplative emotions such as *wonder*, *nostalgia* and *transcendence*, although it nevertheless includes terms familiar from basic emotions (*sadness, joyful activity, power, tenderness, peacefulness* and *tension*). To understand the freshness of this model we must remember that during the previous fifteen years of music research, emotions had typically been forced into categories comprising a few basic emotions or positively and negatively valenced affective states (Eerola & Vuoskoski, 2012).

To summarise the plethora of emotion models and concepts in existence, let me illustrate some of the relationships between them and demonstrate how research at different conceptual levels and involving different frameworks of emotions can be compatible and meaningful across such frameworks. Figure 16.3 shows how the relationship music representing sadness may be transformed into separate emotional experiences (*nostalgia*, *moved* and *wonder*) at a higher level, with simplified representations of the focuses of emotions and what can be measured at each level.

In the lowest level, emotions are described through dimensions taken to represent physiological systems responsible for core affects (arousal, valence), although the exact formulation of such low-level dimensions could be based on tension and energy or other variants.

When the levels of explanations are expressed in this hierarchical fashion (see Figure 16.3), the low-level dimensional representations of core affects can be measured through the neural and endocrine systems; however, we do not yet have descriptors for the fluctuations in core affects. When enquiring into recognised emotions, discrete labels are employed. Typically, the basic emotion categories are appropriate when dealing with recognition (e.g., we recognise whether music sounds sad) and these can be applied using a range of self-reports, from forced-choice tasks to rating scales.

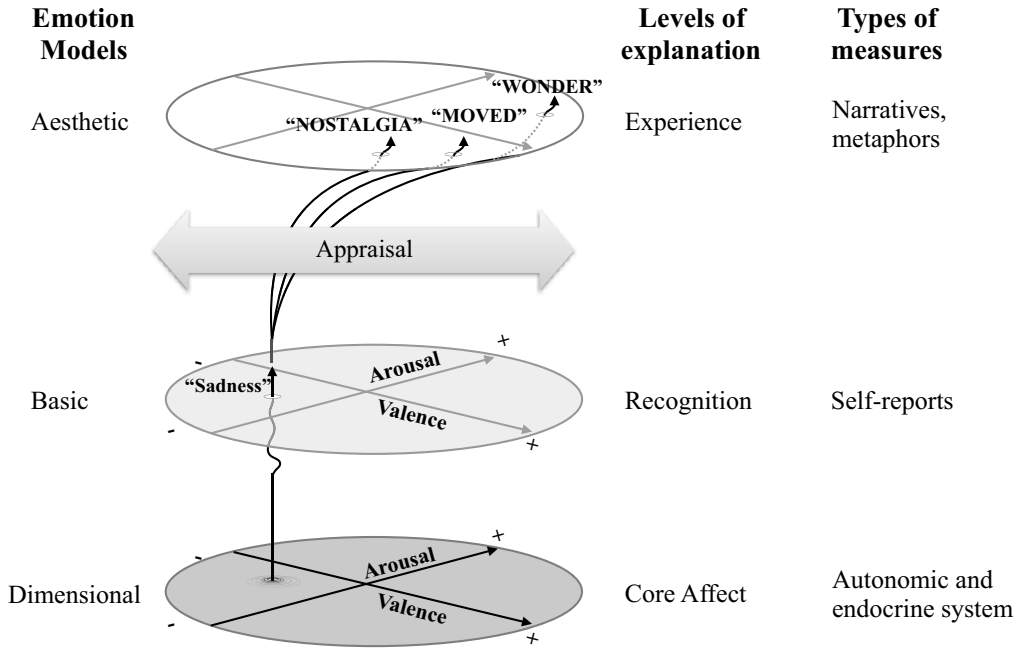

Figure 16.3 Three levels of emotion models and explanations with sadness as an example

Moreover, if we consider experienced emotions to be aesthetic or complex in their nature, we should also acknowledge that they tend to be heavily affected by high-level mechanisms (memories) and modifiers (situation, differences between individuals) as well as by language and culture. These mechanisms may lead to different emotions arising, despite apparent similarities at the lower levels of explanation. Sad sounding music such as the national anthem of Israel (Hatikvah)–which has a slow tempo, uses small intervals and is in a minor key–may be associated with joyful personal memories or specific cultural conventions that overwhelm the low-level expressive cues signalling sadness (see Brauer's chapter in this *Companion* for a discussion of striking examples of this). To further complicate matters, the three levels of explanation are differently influenced by the various mechanisms and modifiers. Here the appraisals play an important role, as these are crucial for the positive shift in emotions experienced compared to emotions expressed (shown in Figure 16.3). The positive shift is likely related to music's lack of direct material effect on the listener's well-being; music listening is usually a voluntary activity that offers a medium in which listeners can safely project their emotions. Sad music is perhaps the best example of the positive shift (for a more detailed account of this shift, see Eerola, Vuoskoski, Peltola, Putkinen & Schäfer, 2018).

Sadness in music can be used to demonstrate the differences in emotional processes across the levels of explanation, as highlighted in Figure 16.3. At the lowest level, sad music is associated with low arousal and negative cognitive biases to thinking. This is thought to be the result of physical changes caused by the emotion through a process called emotional contagion, which will be explained in the next section. In the second, recognition, level of the scheme in Figure 16.3, listeners easily recognise sad music as "sad," and this recognition seems to be fairly stable even across cultures (Laukka, Eerola, Thingujam, Yamasaki & Beller, 2013). The paradox of fiction arises when high-level experienced emotions are considered. At this level of experiences, sad music typically, though not always, creates positive experiences such as nostalgia, being moved or even experiences of wonder (Peltola & Eerola, 2015; Taruffi & Koelsch, 2014).

It should be acknowledged that the simple three-level scheme in Figure 16.3 does not explain how different emotional outcomes are achieved at the experiential level, since the emotions are dependent on emotion induction mechanisms and other mediating issues (individual differences, mood, etc.). For instance, sad music may be connected to fond memories, leading to feelings of nostalgia, but memories of personal loss, such as the death of a child or spouse, may cause some people to report experiences of intense pain, fear and anxiety when listening to specific pieces of sad music (Peltola & Eerola, 2015).

Body and Emotions

The mechanics of how a piece of music might express emotion or evoke a particular set of emotions in listeners is not yet completely understood. An influential theoretical framework for experienced emotions was proposed by Patrik Juslin and Daniel Västfjäll in 2008. This framework consists of eight mechanisms, which can be divided into two low-level processes (physiology and embodiment) and two high-level processes (memory and appraisal). For the example of music and sadness, let us consider the mechanism believed to be responsible for initial recognition of sadness in music. The mechanism called *emotion contagion* consists of a process in which the "listener perceives the emotional expression of the music and then 'mimics' this expression internally" (Juslin & Västfjäll, 2008, p. 565). This mechanism is embodied in the sense that it involves a reactivation of past sensory and motor mechanisms (Barsalou, 2009; Niedenthal, Winkielman, Mondillon & Vermeulen, 2009). The embodied framework recognises that the body plays a major role in all interactions with the environment and views any response to stimuli as based on re-enactments of the nonverbal expressions and affective states of other people (Barsalou, Niedenthal, Barbey & Ruppert, 2003). Such mapping may arise within expressive channels, such as matching another person's facial expressions or vocal intonations, but also may occur across channels, i.e. between audio and visual (Arnott, Singhal & Goodale, 2009; Dimberg, Thunberg & Elmehed, 2000).

Taken further, this means that basic emotions are linked to specific bodily reactions and that motor patterns are influenced by the production or causal results of experiencing that emotion (Scherer et al., 2003). Such bodily changes create a library of cues that reflect the emotional experience or its output (movements, expression, sounds, gestures of such states). When attempting to decipher the intended emotion, we rely on internal mapping between an external stimulus and our representation of the possible cue combinations. If we take the example of sadness, the peripheral nervous system in this case is associated with changes in the hypothalamic–pituitary–adrenaline axis leading to the state of anhedonia, which quickly lowers autonomic arousal and lower muscle tone and reactivity (Watt & Panksepp, 2009). This in turn leads to quieter vocal output, lower pitch, a more muffled and darker timbre and slower movements than in a neutral or positive emotional state. These sets of cues, which, interestingly, are very similar in music and speech, are therefore grounded in physical changes caused by underlying emotion states (Juslin & Laukka, 2003). Knowledge of these multimodal codes allows us to decipher the intended emotional expressions and this knowledge is assumed to be implicit and accessible by embodied simulation ("what would I feel like if I sounded like that . . ."). Even when merely activating some of the motor programmes used in simulations, we may catch the same emotions or at least our emotional reactions may be amplified (Niedenthal, 2009).

Conclusions

This summary of the psychological, neuroscientific and aesthetic approaches to music and emotions traced three topics of interest; the evolution of dimensional models of emotions, an increased interest in aesthetic emotions and the role of the body in explaining the emotions. Here, an attempt

to bridge these three topics was made by regarding emotions in a hierarchical fashion through the levels of explanation. All three topics have extensive histories, but have often been applied in a rather circumscribed fashion to psychological explanations of emotions in music. The addition of aesthetic emotions has expanded the range of possible emotions and allowed music psychologists to be interested once more in complex experiences such as awe and wonder. These emotions may be problematic if they are not sufficiently well connected to lower levels of emotions or the mechanisms shaping the emotions. Finally, the way in which primitive emotions are assumed to be recognised through contagion arising from embodied reenactment was briefly covered. This notion has not yet penetrated music and emotion research and thus we have not yet fully capitalised on the reasons underlying the robustness of cues for emotion recognition and induction in music and speech.

When the emotions associated with listening to sad music are considered within these levels of explanation, it is straightforward to connect the physiological states and ensuing cues to expressive characteristics as well as the dimensional model of affects. However, when attention shifts to the emotions experienced when listening to sad music, the results typically become more differentiated. Appraisal and memory mechanisms would most likely influence the emotional outcome, which could lead to markedly different emotions from those expressed. For instance, an individual hearing Samuel Barber's *Adagio for Strings* for the first time in a particularly receptive situation (say, in a church during a funeral service) might experience the emotion as inconsolable grief and become choked with emotional intensity arising from the loss that the music seems to magnify in that situation. Another individual who is highly familiar with the piece might experience "nostalgia" due to fond recollections of past performances. For a third person, an appraisal of the aesthetic qualities (e.g. beauty) of the music could steer the experience toward feelings of awe or of being moved due to appreciation of the classical music canon. Such trajectories of emotional experiences, illustrated in Figure 16.3, that diverge from the expressed emotions in various ways may have created conflicting results and interpretations in past research that has attempted to limit emotions to a single conceptual level. By acknowledging the different mechanisms and the levels of explanation, it becomes easier to reconcile seemingly paradoxical emotional experiences. Sadness is only paradoxical if the transformation between the levels is not acknowledged.

One could argue that sad music is an exception as a source of emotions, due to its paradoxical tendency to engender positive emotions. However, a similar paradox can be found in all nominally negative emotions within the context of art and fiction. The thrill of viewing horror films, the catharsis obtained from watching a tragic play and the sorrow expressed in literature all face the same issues of how to appropriately measure, conceptualise and explain such experiences, which we hold as most important, valuable and uniquely human.

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17

WHY WE LISTEN TO SAD-SOUNDING MUSIC

Philosophical Perspectives, Psychological Functions and Underlying Brain Mechanisms

Liila Taruffi and Stefan Koelsch

Introduction: The Paradox of Sad Music

In 1976, Elton John's *Sorry Seems to Be the Hardest Word* climbed to No. 1 on the U.K. Singles Chart as well as to No. 2 on the Eurochart Hot 100. Back then, this heartrending song sold over 1 million copies within the U.S. alone. Elton John's hit is just one example among hundreds of different sad songs that dominate the charts every year. Sadness is one of the most commonly reported music-evoked emotions and sad pieces are often considered the most beautiful and pleasurable music. Indeed, listeners from around the world deliberately turn to sad songs, despite the fact that the music and/or the lyrics evoke sorrowful memories or emotions usually thought to be undesirable. Yet our understanding of aesthetic and emotional responses to sad-sounding music is rather limited. At the base of sad music's conundrum lies a crucial question which has puzzled philosophers since Antiquity and that has received much attention in recent thought (Aristotle, 1986; Burton, 1621; Davies, 1997; Hume, 1757; Kivy, 1989; Levinson, 1997; Robinson, 1997). If sadness is a negative emotion normally avoided in everyday life, why then are people so drawn to sadness in music? This is a relevant question because sad music undoubtedly plays an important role in our lives considering its popularity around the world. Interestingly, the appeal of sad music appears to be perhaps more widespread today than ever. Research in psychology has shown that over the past half-century, the proportion of pop songs written using minor mode has doubled and that a song's average tempo has decreased, suggesting that popular hits have become more sad-sounding (minor mode and slow tempo are two important acoustic characteristics conveying sadness in music) (Schellenberg & von Scheve, 2012). Likewise, the lyrics of popular U.S. songs from 1980–2007 have become more self-focused and negative over time (DeWall, Pond, Campbell & Twenge, 2011).

Clearly sad music differs across various musical systems. For example, in Western music the minor mode is associated with sadness (Gagnon & Peretz, 2003). However, in a number of non-Western cultures (especially those in Middle East), the minor mode does not have sad connotations. Despite culture-specific features, hints at universal cues to sadness in music come from a study of the Mafa tribe in Northern Cameroon (Fritz et al., 2009). In this study, Mafas, who had no prior exposure to Western music, showed an ability to recognise sad (as well as happy and fearful) excerpts

of Western piano music. Furthermore, another study showed that Western listeners can reliably judge whether pieces of Kyrghistani, Hindustani and Navajo Native American music are happy or sad based on their tempo (Balkwill & Thompson, 1999). This highlights the fact that some universal indicators of emotion (e.g., tempo) appear to work across cultural boundaries. (People might be able to identify the emotional tone of music from an unfamiliar tonal system based on its association with emotional speech, as supported by evidence of parallels between affective cues in speech and music; Juslin and Laukka (2003); see also Loutrari & Lorch in this *Companion*).

Sad music is not only a Western phenomenon typically illustrated by Classical music, but it can be found cross-culturally among a wide range of musical genres. Fado, a form of Portuguese folk music, is a great example of a musical genre based entirely on both sad acoustic and musical features (e.g., slow tempo, legato, low pitch, etc.) as well as sad lyrics. The essential element of fado is indeed the so-called "saudade," a Portuguese word with no direct translation in English that describes an emotional state of melancholy and profound longing for unrealised dreams. Further, according to Indian aesthetics, sadness is one of the eight "rasas" or aesthetic essences (specifically the "karuna rasa"). Rasas can be seen as the emotional impact that an artwork aims to evoke in the listener (Thampi, 1965). Thus, the widespread presence of sad-sounding music and sadness as an aesthetic category suggests that, despite obvious differences due to culture and musical systems, the emotional experience underlying this type of music might tap into important aspects of human emotion.

In this chapter we will shed light on the so-called "paradox of sad music" by showing that sadness and pleasure can be two coexisting facets of the emotional response to sad-sounding music. A piece of sad music can move us to tears, but those tears are often felt as pleasurable or bittersweet. But how can sad music evoke pleasurable emotions at all? Is music-evoked sadness or in general sadness evoked in aesthetic contexts, different from "everyday" sadness? And can the recent advances made by neuroscience shed light on a topic that has always belonged to the purview of philosophy? The questions raised by sad music encompass such an intricate network of human experiences (emotional, cognitive, social and aesthetic), that substantial progress in answering these questions can only be achieved through an interdisciplinary approach to research. Therefore, in the present chapter the phenomenon of enjoyment of sad music is explained by comparing and integrating philosophical perspectives with up-to-date empirical findings from psychology and neuroscience. The first part of the chapter reviews the most influential historical positions on the subject, such as Aristotle's theory of *catharsis*, the debate between cognitivists and emotivists, as well as Levinson's theory on music and negative emotion. The second part presents an overview of the current psychological research on sad music and introduces a new model of listener characteristics and contextual factors contributing to emotional responses and psychological effects of sad-sounding music. In the third part, we examine neuroimaging research that has identified brain structures and networks involved in music-evoked sadness and "chill" experiences.

Philosophical Perspectives

The Tragedy Paradox: Aristotle's Catharsis

The "paradox of sad music" is one particular variant of the more general "paradox of tragedy," which relates to all art forms and is one of the oldest philosophical problems still under debate. In particular, the paradox of tragedy is concerned with how we can experience delight from fictional works representing unpleasant events, given that we do not do so when such events are "real." For instance, we generally avoid things or situations that are upsetting or fear-inducing. Similarly, no one would take pleasure in the loss of a loved one. Instead, "people apparently take great delight in watching and hearing about people in hideously unhappy situations and undergoing terrible suffering" (Robinson, 1997, p. 18). As an example, consider the tale of Antigone written by Sophocles

in 441 BC. Antigone's brother, Polyneices, was killed in the battle to conquer Thebes and was not granted a funeral ceremony by his uncle Creon, king of Thebes. Antigone, moved by love for her brother and convinced of the injustice of her uncle Creon's decision, buried her brother secretly. For this reason, Creon ordered her execution. She was confined to a cave, where she finally hanged herself. Because people for centuries have engaged with similar tragic artworks with a sense of pleasure (not only tragedies, but also music, dance, movies, novels, paintings, etc.), it is important to explain what "tragic pleasure" is.

Long before David Hume offered the classic formulation of the "paradox of tragedy,"[1] central aspects of this conundrum were already identified by Aristotle, who briefly wrote about it in his *Poetics* (1986; see also Pelosi in this *Companion*). Aristotle's approach to the paradox of tragedy – the so-called theory of catharsis – consists of interpreting the quest for sorrow as an attempt to find relief from negative emotions, such as fear and pity (Aristotle, 1986). In other words, the function of tragedy is to release a certain amount of fear and pity that were evoked in response to the suffering of the characters in the tragedy. Some scholars have interpreted *catharsis* as *purgation* strictly in medical terms based on the use of *catharsis* in previous Aristotelian works (e.g., Nuttall, 1996). According to ancient Greek medicine, health was due to a balance of the four humours; thus *purgation* would stand for the partial removal of those humours in excess in the body. Other scholars have instead highlighted the psychological and therapeutic effects of *purgation*: the expressive emotional features of tragedy offer people the possibility of venting negative emotion that they are afflicted with, thus improving their overall well-being and restoring the emotional equilibrium (e.g., Lucas, 1949; Shelley, 2003). Current psychological research confirms indeed that people commonly use sad music to achieve different self-regulatory goals, including venting of negative emotions and moods (Eerola & Peltola, 2016; Garrido & Schubert, 2011b; Taruffi & Koelsch, 2014; Van den Tol & Edwards, 2011; for details see the following section "Psychological research").

The Cognitivist Take on Music-Evoked Sadness

Another answer to the longstanding philosophical discussion on the paradox of tragedy was provided by the "cognitivist" philosophers in the last century and it specifically dealt with musical emotions. Cognitivists argued that when we listen to sad music, we do not experience genuine sadness at all, but we merely recognise the sadness depicted by the music (Kivy, 1989). In this regard, it is important to distinguish "perceived" emotion (the emotion expressed by the music) from "felt" emotion (the emotion evoked in the listener by the music), which do not necessarily overlap. By denying that listeners respond emotionally to sad music, the problem of the enjoyment of sadness through music is consequently eliminated (if I am not saddened by sad music then it is not paradoxical that I enjoy it).

Peter Kivy illustrated this idea in the *Corded Shell* (1980), where he distinguished between being "expressive of" (perceived emotion) and "expressing" (felt emotion). For instance, most people see the face of a Saint Bernard as melancholic, because the corners of its eyes are typically turned down. However, the fact that the dog's face is "expressive of" melancholy does not imply that the dog feels melancholic, something which we cannot assert. Instead, a person scowling and shouting is said to "express" genuine anger, because the person is actually angry. Similarly, sad music is "expressive of" sadness, rather than "expressing" sadness. In this sense, the cognitivist theory relies on the fact that sad music's expressive properties resemble verbal expressions of sadness and bodily movements experienced when such emotion is evoked. For example, acoustic properties of sad music, like low volume, slow tempo or minor mode, imitate the sadness expressed in the voice and/or behaviour of people (Juslin & Laukka, 2003). However, even if listeners mistake the sadness depicted in Barber's *Adagio for Strings* with their own sadness, how can Kivy's theory account for intense emotional responses, such as crying, often reported by listeners? Kivy acknowledged that

people can still feel deeply moved by a piece of sad music; however, such feeling of "being moved" is due to the beauty of the music rather than to its emotional quality (e.g., being sad or happy).

The opposite view of cognitivism is "emotivism." Emotivists agreed that when perceiving music we react affectively and that there is a link between perception and induction of emotion. Specifically, the recognition of an emotion in music may often lead, although not necessarily, to the arousal of the same emotion in the listener. Most importantly, sad music induces an emotion similar to "real" sadness, although it is not clear to what extent they overlap (Levinson, 1997). However ordinary emotions (also known as "utilitarian" emotions; see Scherer, 2004) are goal-oriented and have a material effect on an individual's well-being, thus having an intrinsic significance (i.e., a survival value) for their lives. For instance, in the case of a failure in something personally relevant, sadness enhances our rational understanding of things and allows us to rest and adapt to the difficult circumstance. Given the relevance of sadness to our lives as biological organisms, does music-evoked sadness have the same significance? Research in psychology can shed some light on this problem by illustrating that sad music actually leads to positive effects on the individual's psychological health (e.g., regulation of negative emotion and mood) and can thus have intrinsic significance for our lives, as Aristotle's theory of cathartic emotions anticipated. Furthermore, empirical research shows that listeners undergo physiological changes and facial muscle activity, specifically activity over the muscle region of *corrugator supercilii*, which is used when frowning during listening to sad music (Krumhansl, 1997; Lundqvist, Carlsson, Hilmersson & Juslin, 2009). Such autonomic and muscolar activity are important components of emotion.[2] In particular, Krumhansl found that listening to sad music is linked to a decrease in heart rate, skin conductance and temperature, consistent with the physiological response patterns of non-crying "real" sadness (Kreibig, 2010; Krumhansl, 1997). Therefore, the manifestation of such physiological and expressive components of emotion while listening to sad music strongly supports the emotivist position in the debate on the authenticity of music-evoked sadness.

Rewards of Music-Evoked Sadness: Levinson

A different solution to the problem of sad music was provided by Jerrold Levinson, who shared a view close to the emotivists. He argued that, even though there is a difference between music-evoked sadness and ordinary sadness, we nevertheless feel "sad" when listening to sad music (Levinson, 1997). He proposed that eight different types of reward explain sad music's appeal. First, he shared Goodman's idea that sad and emotionally intense responses to music facilitate our grasp of the expressive qualities of a musical work (Goodman, 1968). Second, he acknowledged the Aristotelian theory of *catharsis*, that sad music can have a therapeutic effect, consisting in venting sadness and sorrow. To understand the remaining rewards of sad music, it is necessary to explain that, according to Levinson, music-evoked sadness is not a full-fledged emotion but rather an "aetiolated" emotion, because it does not have an intentional content (i.e., an object to which the emotion is directed to). For instance, to feel sad in "ordinary life," one must know that there is something (an intentional object) that is painful or sorrowful, such as the death of a loved one. Instead, when we are saddened by sad music, we are not sad about "something" (that is, nothing has happened in "real life"). Therefore, the difference between ordinary sadness and music-evoked sadness lies in the absence of a cognitive component of emotion in music-evoked sadness or more precisely in the absence of "real-life" implications. In fact, "there is still a cognitive dimension to this emotion (i.e., music-evoked sadness), but it has an indeterminate focus: I imagine that there is something I am sad about and that I believe some situation or other to be unfortunate, but there is nothing in *particular* I am sad about nor is there any *particular* situation that I believe to be unfortunate" (Robinson, 1997, p. 19).

Despite such differences, the qualitative experience of music-evoked and ordinary sadness, including its subjective feeling and the correlated bodily sensations, are still comparable. Therefore, because of its lack of "real-life" implications, we are able to enjoy music-evoked sadness by: 1) savouring the qualitative aspects of sadness for its own sake, as a sommelier does when tasting wines (*reward of savouring feeling*); 2) understanding the feeling of sadness more clearly on its own (*reward of understanding feeling*); 3) reassuring ourselves about our ability to feel intense emotions (*reward of emotional assurance*). Furthermore, according to Levinson, evocation of sadness through music is possible through empathic processes, largely based on the ability to imagine the music as a person.[3] As Levinson explained, "When we identify with music that we are perceiving – or perhaps better, with the person whom we imagine owns the emotions or the emotional gestures we hear in the music – we share in and adopt those emotions as our own, for the course of the audition" (Levinson, 1997, p. 228). Therefore, because the evocation of sadness is linked to imaginary processes, we are able to take pleasure in music-evoked sadness by: 1) deriving a sense of control and mastery that arises from identifying ourselves with sad music that resolves happily (*reward of emotional resolution*); 2) identifying with the music to the point of imagining oneself to have the same richness and spontaneity of the sadness expressed by music (*reward of expressive potency*); 3) sharing the sadness of another human being such as the composer (*reward of emotional communion*).

A survey-study from our research group empirically tested the rewards proposed by Levinson with an international sample of 772 participants (Taruffi & Koelsch, 2014). We prepared a questionnaire devised to explore such rewards and we conducted a principal component analysis on its items. Our findings indicate that there are at least four dimensions of reward of music-evoked sadness: *reward of imagination* (the pleasure derived from imaginative processes), *reward of emotion regulation* (the pleasure derived from the achievement of different self-regulatory goals, such as mood enhancement and venting of negative emotion), *reward of empathy* (the pleasure associated with sharing the sadness portrayed by the music as an expression of another's emotion, such as the composer) and *reward of no "real-life" implications* (a type of pleasure that lacks any extra-musical or contextual implications). Two out of the four identified rewards (i.e., *reward of no "real-life" implications* and *reward of empathy)* are pleasurable experiences derived from listening to sad music, but not happy music.

Psychological Research

Nostalgia and Memory

What emotions do people experience when listening to sad music? Research in music psychology, employing novel measures for assessing the emotional responses to music such as the Geneva Emotional Music Scales (GEMS), shows that sad music evokes not only sadness, but also a wide range of complex and partially positive emotions, such as nostalgia, peacefulness, tenderness, transcendence and wonder (Taruffi & Koelsch, 2014; Zentner, Grandjean & Scherer, 2008).[4] Among these emotions, nostalgia is the most frequent. Nostalgia is a complex emotion often triggered by music and has been characterised as "bittersweet," because it includes both positive and negative facets, such as joy and sadness. Interestingly, many listeners indeed report experiencing sadness-related feelings by listening to music that is linked to personal memories (Davies, 1978 See also Hara & DeNora in this *Companion*). Because the retrieval of autobiographical memories from the past is closely linked with the experience of nostalgia and because sad music is often used to evoke memory of personal past events, it is not surprising that nostalgia has been found to be the most frequent emotion evoked in response to sad music (Davies, 1978; Sedikides, Wildschut, Arndt & Routledge, 2008). Autobiographical memory and nostalgia are intrinsic components of the experience underlying listening to sad music.

Functions of Sad Music

People listen to sad music in their daily lives to fulfill different purposes. Despite the popularity of sad music, surprisingly few studies to date have looked at the particular uses of sad music (Eerola & Peltola, 2016; Garrido & Schubert, 2011b; Taruffi & Koelsch, 2014; Van den Tol & Edwards, 2011). These studies, all employing retrospective questionnaires, have consistently indicated that the most important functions of "self-defined" sad music are the following: 1) regulation of mood and emotion; 2) retrieval of autobiographical memories of valued past events or people; 3) consolation; 4) relaxation; 5) introspection; 6) aesthetic pleasure; and 7) expression of emotions.

A comparison between the everyday uses of sad and happy music has yielded further insights into the unique functions of sad music (Taruffi & Koelsch, 2014). Specifically, listening to sad music fulfills various "inner" functions (directed to one's own conscious thoughts and emotions) linked to solitary settings (e.g., evoking memories about the past, engaging in introspective thinking or fantasising about the future), whereas happy music mainly fulfills "outer" functions (directed to the sociocultural network to which one belongs) linked to social settings and arousal regulation (e.g., dancing and entertaining). Most importantly, these results indicate that the use of music to regulate negative emotion and to provide comfort (which will be discussed in detail below) is the most relevant use for sad music in contrast to happy music.

Emotion Regulation Strategies of Sad Music: "Misery Loves Company"

The web is overflowing with sad music playlists, which listeners turn to when they are feeling down (Taruffi & Koelsch, 2014; see also Lamont in this *Companion*). Indeed, people report that they particularly engage with self-defined sad music during a break up, but also while being away from a loved one or when feeling homesick.[5] At first impression, such uses of sad music might appear to be a challenge to well-being, however findings suggest that they may actually lead to beneficial emotional effects (Taruffi & Koelsch, 2014; Van den Tol & Edwards, 2011). It appears that many listeners rely on their sad playlists when in emotional distress, searching for comfort and solace in the absence of social support and that, in those cases, sad music can be experienced as pleasurable and rewarding. Thus, even those everyday functions of sad music that seem to be dysfunctional may be adaptive means of emotion regulation, which in the long-term could prove beneficial for well-being.

Emotion (or mood) regulation strategies refer to goal-directed mechanisms people adopt in order to influence their emotions and moods and consequently have an impact on how they experience and express such emotions and moods (Gross, 2008). Emotion regulation strategies of sad music are diverse and can be distinguished into the following terms: *catharsis*, *cognitive reappraisal*, *connection*, *distraction* and *relaxation*.[6] *Catharsis* occurs late in the emotion-generative process, after response tendencies have been initiated and involves increasing the physiological and/or behavioural expressions of emotion (see Pelosi in this *Companion*). The emotions depicted by sad music are used here to enhance the experience of sadness, which in turn helps to express it and vent it. *Cognitive reappraisal* involves changing the listener's emotional response to a given situation, by changing how he/she thinks about the situation or by changing his/her ability to respond to the situation at hand (Gross, 2008). In this sense, sad music may help to create an inner space for reflection and recollection of emotion, thus facilitating overall reappraisal. *Connection* involves selecting music on the basis of one's own emotional state in order to relate closely to the music's content, as if it were a "friend." Virtual social contact through music (i.e., perceiving the music as a "friend") facilitates one's getting in touch with one's own negative emotions as well as mood sharing processes, with both processes providing feelings of comfort and consolation. Such consolatory effects can help to regulate sadness and ease pain. *Distraction* involves a shift of attention away from the emotional aspects of the situation toward the music. *Relaxation* involves directly decreasing ongoing physiological

or behavioural expressions of emotion by adjusting them to the music's emotional expression (e.g., listening to slow tempo music before going to bed).

In which circumstances do these strategies lead to the successful regulation of emotion? There is substantial evidence that *cognitive reappraisal* is generally the most successful emotion regulation strategy, especially for a long-term perspective (see for instance Chin & Rickard, 2014). This is due to *cognitive reappraisal* coping with emotional distress directly by facing it rather than diverging from it, as other strategies might do (e.g., *distraction*). If some strategies, such as *cognitive reappraisal*, generally have beneficial consequences, whereas others, such as *distraction*, tend to have negative side effects, "why doesn't everyone use *reappraisal* and not *distraction*?" (Gross, 2008, p. 505). A possible explanation is that differences in culture and personality traits make people pursue different emotion and mood regulation goals (Mesquita & Albert, 2007). An example is given in a case study of Garrido and Schubert, who suggested that people with ruminative tendencies might experience more sadness and displeasure while listening to self-selected sad music when they are themselves already experiencing sadness, because of their inability to effectively down-regulate this emotion (Garrido & Schubert, 2011b). Future effort should be made to identify how personality, culture, musical preference as well as emotion regulation dispositions can interact with each other and exert positive and/or negative effects on well-being.

Personality Traits

A number of studies have attempted to explain the enjoyment of sad music in light of individual differences in personality traits (Garrido & Schubert, 2011a; Taruffi & Koelsch, 2014; Vuoskoski, Thompson, McIlwain & Eerola, 2012). Some individuals are more likely to enjoy listening to sad music than others, suggesting that this inter-individual variance can modulate the enjoyment of sad music (Garrido & Schubert, 2011a).

The trait of empathy (a personality trait that characterises individuals with a tendency to experience empathy more readily than others across different situations; see Davis, 1980) influences both the enjoyment of and the sensitivity to sad music (Eerola, Vuoskoski & Kautiainen, 2016; Garrido & Schubert, 2011a; Taruffi & Koelsch, 2014; Vuoskoski & Eerola, 2012; Vuoskoski et al., 2012). In other words, individuals who score high on the trait of empathy (measured by self-report questionnaires) experience more intense and pleasurable emotions while listening to sad music compared with individuals who score low, suggesting that dispositional empathy may facilitate affective sharing of music-evoked sadness. Moreover, the association between the trait of empathy and sad music draws also on cognitive aspects of empathy, as indicated by the positive correlation between the empathy subscale *fantasy* and the liking of sad music (Taruffi & Koelsch, 2014; Vuoskoski et al., 2012). The fantasy subscale of the Interpersonal Reactivity Index assesses people's tendency to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies and plays (Davis, 1980).

Furthermore, the trait dimension of absorption, which describes a propensity to become absorbed in mental imagery, predicts the enjoyment of sad music (Garrido & Schubert, 2011a).[7] Absorption allows an individual to fully commit to an attentional object and to disengage with the "external" situation or conditions that are unrelated to that object. The cognitive component of this personality dimension is characterised by an ability to create vivid mental representations and to engage with them empathetically.

The SADMUS Model

Figure 17.1 shows a heuristic model of listener characteristics and contextual factors contributing to emotional responses and psychological effects of sad-sounding music based on the points discussed

in this section. The model summarises the state-of-the-art in this field of research and provides a theoretical framework that can inform future empirical studies on sad music. According to the SADMUS model, sad music can elicit a rich range of emotions, including sadness, feelings of pleasure or reward, and sublime emotions such as nostalgia, peacefulness, transcendence, tenderness and wonder (box 3B). More than one emotion can be evoked simultaneously, which is very often the case. Emotions are evoked through a number of principles that describe the different mechanisms through which listeners react affectively to sad music (box 2). Such principles encompass *memory*, *appraisal*, *contagion*, *social functions*, *understanding*, *imagination* and *expectancy* (for a more detailed discussion of each principle see Juslin & Västfjäll, 2008; Koelsch, 2012). Importantly, the model illustrates the listener characteristics (boxes 1A and 1B) and contextual factors (boxes 1C and 1D) that contribute to the evocation of sadness, pleasure and other emotions through sad music. Listener characteristics refer to individual differences in personality traits (i.e., empathy, absorption, emotional stability and rumination; box 1A) and to the mood of the listener prior to music exposure (i.e., positive or negative; box 1B). Contextual factors include specific aspects of the unique relationship between a song and a listener (i.e., the degree of familiarity with a piece of music – which also encompasses familiarity with the musical genre of the piece as well as with the composer/band – and the extent to which the song is linked to an autobiographical memory of the listener; box 1D). For example, autobiographical salience is a contextual factor that is particularly relevant in the evocation of sadness and nostalgia through the *memory* principle.

The SADMUS model also takes into account interactions between listener characteristics and contextual factors. For example, it is possible that the autobiographical salience of a song might contribute to stronger music-evoked sadness and/or nostalgia in individuals who are already in a sad mood. The model allows the distinction of emotional effects of sad-sounding music (box 1C) due to acoustic properties (e.g., instrumental music) or to lyrics (e.g., pop song). Furthermore, it outlines the psychological benefits [i.e., *self-reflection*, *mood sharing*, *consolation, relaxation, distraction,*

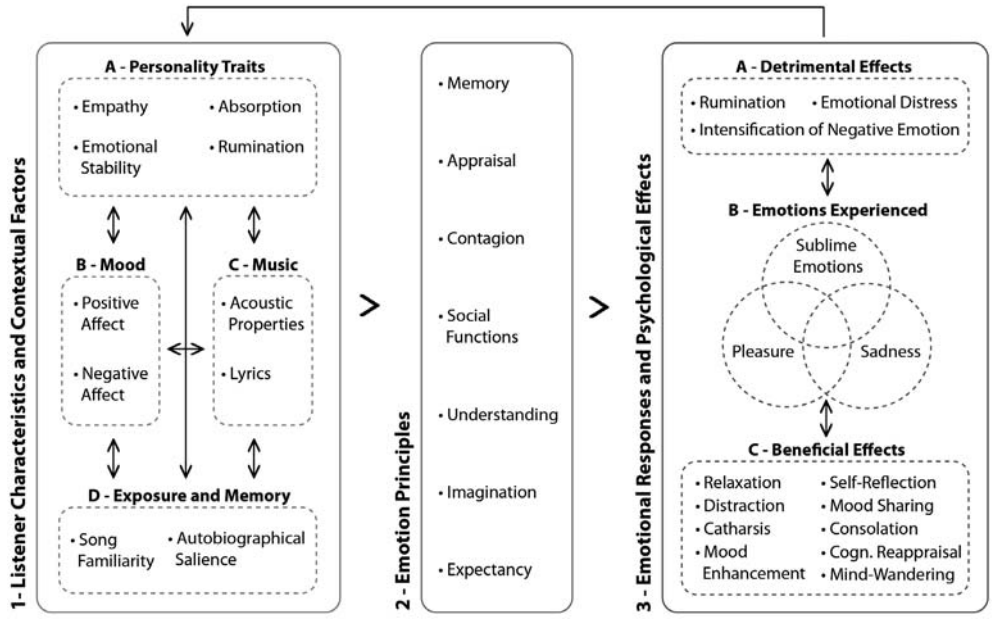

Figure 17.1 The SADMUS model of listener characteristics and contextual factors contributing to emotional responses and psychological effects of sad-sounding music

catharsis, cognitive reappraisal, mood enhancement and *mind-wandering* (see following section)] that can be obtained by listening to sad music (box 3C). Finally, the model also describes the possibility of a maladaptive outcome (box 3A) originating from listening to sad music (i.e., *rumination*, *emotional distress* and *intensification of negative emotion*).

Brain Imaging Studies

Neural Correlates of Music-Evoked Sadness

Over the past 10 years, a number of functional neuroimaging studies have used sad and happy music to investigate neural correlates of music-evoked sadness and happiness (Brattico et al., 2011; Brattico et al., 2015; Caria, Venuti & de Falco, 2011; Green et al., 2008; Khalfa, Schon, Anton & Liégeois-Chauvel, 2005; Mitterschiffthaler et al., 2007; Trost, Ethofer, Zentner & Vuilleumier, 2012).[8] These studies have pointed to a number of key emotion-related structures, which may play a major role in music-evoked sadness. For instance, Mitterschiffthaler and colleagues found that music-evoked sadness was related to increased BOLD signal responses in limbic structures such as the hippocampus and amygdala (Mitterschiffthaler et al., 2007). Activity in the hippocampus during music-evoked sadness was corroborated by Trost et al. (2012). Furthermore, contrasting sad music with lyrics with sad music without lyrics revealed activity in the bilateral amygdala and the right parahippocampal cortex, consistent with the results of Mitterschiffthaler et al. (Brattico et al., 2011; Mitterschiffthaler et al., 2007). Moreover, music-evoked sadness was linked to activity in the bilateral insula (Caria et al., 2011). The processing of sad music also correlated with activity in cortical structures. In particular, activations of the anterior fronto-median cortex (BA 9/10) were reported for minor music in contrast to major music and for sad music with lyrics in contrast to sad music without lyrics (Brattico et al., 2011; Green et al., 2008; Khalfa et al., 2005). Moreover, activation of the ventromedial prefrontal cortex was reported in response to excerpts of classical music evoking sadness (Trost et al., 2012).

Despite the fact that these findings certainly point to a number of relevant brain structures, it should be mentioned that several methodological inconsistencies and problems in the above-mentioned studies make it difficult to compare their results and to disentangle the effects of music-evoked sadness from other factors. For example, the use of well-known excerpts of Western classical music such as the *Adagio in G minor* by Albinoni is problematic because familiarity with the music was not assessed (Mitterschiffthaler et al., 2007). Familiarity can easily mediate extra-musical associations and has been proven to strongly affect emotional experience underlying music listening, thus it is an important variable to consider in such studies (Pereira et al., 2011). Moreover, although a few studies used major and minor mode to convey happiness and sadness, overall sad- and happy-sounding stimuli were not matched for important acoustic properties such as tempo or timbre and, therefore, largely differ among their acoustic and musical properties, making it difficult to estimate the contribution of minor and major mode to music-evoked sadness and happiness (Brattico et al., 2011; Green et al., 2008; Khalfa et al., 2005; Mitterschiffthaler et al., 2007). Another important issue is, to what extent is the evidence provided by the reviewed studies related to emotional experience? Although some studies assessed felt distinguished from perceived emotions, other studies employed tasks requiring emotion recognition and not necessarily emotion evocation (Caria et al., 2011; Trost et al., 2012). Therefore, their results might simply reflect recognition rather than evocation of sadness (in line with the cognitivist view on musical emotion). Even if it is particularly challenging to disentangle perceived and felt emotion empirically, in the future physiological and *indirect* measures of emotions may be exploited to circumvent this problem.

Despite such limitations, most of the brain structures highlighted by the music studies have also been found to correspond to the neural correlates of sadness elicited in response to stimulus material

other than music (faces, pictures and recall of personal sad events; e.g., Côté et al., 2007; Damasio et al., 2000; George et al., 1995; Liotti et al., 2000; Posse et al., 2003; Wang, McCarthy, Song & LaBar, 2005). Further research is required to understand how such structures functionally interact with each other (i.e., functional connectivity, which is defined as the correlation between spatially remote neurophysiological events). Specifically, it will be important to clarify whether their functional relationship is the same for music-evoked sadness and "real" sadness. By addressing this issue, a substantial contribution can be made to the current debate about the nature of musical emotions, whether they are "aesthetic" or "real" emotions (Scherer, 2004).

The investigation of functional networks implicated in music-evoked sadness may reveal precious information about the complex experiences underlying listening to sad music. In the previous section, we described the different everyday uses of sad music (e.g., memory, self-reflection and mood regulation), showing that they differ from the uses of happy music (e.g., entertainment) to a large extent. Similarly, such differences are likely to be represented on a neural level by the engagement of fairly different neural networks in the brain. Thus, analyses of neuroimaging data aimed at unveiling brain networks, such as functional connectivity or eigenvector centrality mapping (ECM),[9] may yield a great deal of information especially when the ecological validity of the experimental settings is kept similar to that of everyday music listening experiences (e.g., use of relatively long music pieces). In a recent fMRI experiment we investigated functional networks underlying music-evoked sadness compared with happiness, during a time-lapse of four minutes per condition in which participants listened to music without any interruption (Taruffi, Pehrs, Skouras & Koelsch, 2017). By using ECM, we demonstrated that music evoking sadness (in comparison with music evoking happiness) engages the main nodes of the default mode network (DMN). The DMN is typically activated when an individual is awake and at rest, and has been consistently linked to spontaneous, self-generated thought (or mind-wandering), including introspection and memory-based constructions/simulations (Andrews-Hanna et al., 2010). In line with this role of the DMN in internally-orientated cognition, we found, in a separate thought sampling experiment, that listening to sad (compared with happy) music is associated with stronger levels of mind-wandering and self-referential thought (Taruffi et al., 2017). Together, these findings underscore the power of music to trigger specific mental processes as a function of its emotional tone, with crucial implications for the application of music in a variety of domains including education and psychotherapy.

Musical Reward and Brain Mechanisms Underlying the Enjoyment of Sad Music

It is now well established that listening to pleasurable music engages the core reward network of the brain (i.e., the mesolimbic dopaminergic reward pathway). The first empirical evidence of such a phenomenon was presented by Blood and Zatorre (2001). In this PET study, the authors investigated neural correlates of highly pleasurable responses to music (i.e., the so-called "chills" or "musical frissons") evoked by listening to favourite music (compared with neutral music) and reported activity in the left ventral striatum, specifically in the nucleus accumbens (NAc) (see Fancourt, and Heggli, Vuust & Kringelbach in this *Companion*). This brain structure is partly innervated by dopaminergic brainstem neurons, thus suggesting the involvement of the dopamine pathway in music-evoked pleasure. Moreover, the NAc plays a major role in both primary rewards (i.e., biologically significant stimuli such as food, sex, social contact) and secondary rewards (money). The results from Blood and Zatorre were consistently corroborated by a number of other neuroimaging studies employing different paradigms and music stimuli (Blood & Zatorre, 2001; Koelsch et al., 2006; Trost et al., 2012). In a seminal study combining PET and fMRI, it was further illustrated that dopamine is released not only in the ventral striatum (NAc), but also in its dorsal component (caudate), during the peak experience of "chills" and the anticipatory moment

before chills respectively (Salimpoor et al., 2011). Thus, this study provided the first evidence for a dissociation of dopamine neurotransmitter activity during the "anticipatory" and "consummatory" stages of music-evoked pleasure. Chills were evoked through music pieces self-selected by the participants and were measured by asking participants about their experience of pleasure while listening to the music, as well as by assessing their physiological correlates (i.e., heart rate, respiration, skin conductance, temperature and blood volume pulse amplitude).

Most of the stimulus sets used in these neuroimaging studies featured a number of well-known sad music pieces (for example, Barber's *Adagio for Strings* was employed by Blood & Zatorre, 2001, as well as by Salimpoor et al., 2011), indicating that sad music can be obviously experienced as highly pleasurable. However, at the moment not many conclusions regarding the nature of reward experience during sad music listening can be drawn from the neuroimaging literature on music-evoked pleasure (for example whether pleasurable states elicited by sad music are related to empathic and imaginative processes as Levinson suggested). For instance, the pleasurable states evoked by various types of self-selected music in the above-mentioned studies likely have to do with mechanisms of emotional expectation. In other words, when we listen to music, we are prone to anticipate what is coming next; the confirmation, violation or delay of our musical expectations are the key mechanisms involved with the evocation of different music-evoked emotions and musical meaning (Juslin & Västfjäll, 2008; Meyer, 1956). According to Meyer, who was the first to provide an exhaustive theory on expectation, the continuous play with expectations in music is paramount to the associated affective and aesthetic response. In line with this framework, the anticipatory stage (or wanting) described by Salimpoor et al. (2011) corresponds to the creation of a musical expectation (by listening to specific patterns of tones, melodies or rhythms) and the consummatory stage corresponds to the fulfillment of such expectations (referred to as the liking phase).

Although expectation mechanisms apply to sad music as well as to any other type of music (meaning that it does not depend on the emotional content of the music, but rather its structure), in the first section we have described different types of rewarding experiences evoked by sad music. Consequently, it would be interesting to verify empirically whether such rewards are associated with different types of neural networks. For example, the rewards of sad music might engage subcortical networks of reward and emotion and cortical networks implicated in higher cognitive functions (social cognition or imagery networks). This remains purely speculative, given that no neuroimaging studies have investigated this possibility so far. Although research on the neural mechanisms involved in the enjoyment of sad music is currently in its early stages, studying the relationship between music-evoked sadness and pleasure promises to provide new insights into aesthetic emotions, emotional experiences in general, as well as reward.

Limitations of Previous Neuroimaging Approaches

So far, the dominant methodological approach used in neuroimaging studies on music and emotion has consisted of minimising the variance brought about by individual differences in emotional responses to music by selecting music stimuli capable of reliably conveying the necessary emotions for a large number of subjects (for instance Mitterschiffthaler et al., 2007). Such experimental paradigms allow the investigation of neural substrates of musically-evoked human emotions independent of listener differences, thus strongly facilitating the ability to interpret results. However, as previously suggested, the lack of inclusion of variables related to listener characteristics represents a pitfall rather than an advantage for such studies (Vuoskoski & Eerola, 2011). This is particularly relevant for the case of sad music, where individual differences play a key role. Music-evoked sadness is indeed a highly subjective yet elusive affective state yielding a multidimensional emotional experience and strongly modulated by individual differences in personality. Therefore, the use of music

stimuli chosen by participants alongside emotion self-reports designed to capture the qualitative differences in emotional experiences, psychometric questionnaires and physiological as well as brain imaging measures could represent a significant improvement of overall validity and may shed light onto the unique experiences associated with music-evoked sadness.

Notes

1 "It seems an unaccountable pleasure, which the spectators of a well written tragedy receive from sorrow, terror, anxiety and other passions, that are in themselves disagreeable and uneasy. The more they are touched and affected, the more are they delighted with the spectacle; and as soon as the uneasy passions cease to operate, the piece is at an end" (Hume, 1757, *Of Tragedy*).
2 According to Scherer (2005) emotions are manifested in the following components: *subjective feelings* (subjective experiences of emotional states), *physiological responses* (bodily symptoms of the undergoing emotion), *expressive behaviors* (facial or vocal expressions of a specific emotion), *action tendencies* (preparation and direction of motor responses) and *cognitive appraisals* (evaluations of the events behind the emotional state experienced).
3 This refers to the hypothesis of a "musical persona," which is the sad person "in the music" with whom I am identifying when listening to a sad music piece.
4 A recent study revealed that music-evoked sadness can be further characterised into *sweet sorrow*, *melancholia* and *grief*, depending on the valence of the overall emotional experience and the contextual aspects (Peltola & Eerola, 2016).
5 In this survey-study, participants were instructed to focus on self-defined sad music and were asked to provide examples of it (Taruffi & Koelsch, 2014). The analysis of a number of acoustic features of the participants' music examples revealed that participants' view of sad music was consistent with the Western cultural representation of sadness in music (i.e., tempo, loudness, energy, dance ability and valence), thus indicating a convergence between self-defined sad music and objective parameters.
6 This is not meant to be an exhaustive list. The strategies mentioned here are the main ones highlighted by previous music research. Interestingly, the strategies of *catharsis* and *connection* map onto Levinson's rewards of *catharsis* and *emotional communion*, respectively.
7 Other personality traits modulating the enjoyment of sad music are emotional instability (Taruffi & Koelsch, 2014) and rumination (Garrido & Schubert, 2015).
8 Music stimuli encompassed excerpts of instrumental music inducing sad and happy emotional states (Mitterschiffthaler et al., 2007; Trost et al., 2012), participants-selected sad and happy music (Brattico et al., 2011; Brattico et al., 2015; Caria et al., 2011), melodies in minor and major mode (Green et al., 2008) and famous excerpts of sad and happy Western classical music (Caria et al., 2011; Khalfa et al., 2005).
9 ECM is a graph-based network analysis technique for fMRI data that measures the importance of network nodes (Lohmann et al., 2010). ECM attributes a value to each measured location in the brain, such that a region receives a large value if it is strongly correlated with many other regions that are themselves central within the network.

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18

WHEN EMOTIONAL CHARACTER DOES NOT SUFFICE

The Dimension of Expressiveness in the Cognitive Processing of Music and Language

Ariadne Loutrari and Marjorie Lorch

Introduction

The power of music and its effect on mood and well-being have been considered throughout history from a variety of perspectives that have reflected contemporary interests at different times. Today, questions of how the brain derives pleasure from music and how one enjoys musical emotions, even when they evoke sadness, constitute part of contemporary explorations in cognitive science. While some of these questions are addressed in other chapters of this book (see Koelsch, Eerola, and Heggli, Kringelbach & Vuust in this *Companion*), here we investigate how the comparison of music with another cognitive faculty, namely language, can contribute to our understanding of emotions, mind and brain.

In this chapter, we critically examine some of the contemporary areas of investigation in the parallel study of language and music in the domain of prosody, the patterns of rhythm and intonation used in both. These areas mainly pertain to the expression of syntactical relationships or emotional tone. In later sections, we raise the question whether the existing research on language and music prosody is sufficient to capture all possible prosodic aspects of speech and music streams. We then go on to consider a novel way of examining "expressiveness" in relation to cognition and present some primary results of employing this approach that point to a dissociation between perception of expressiveness and other systematically studied aspects of auditory cognition, such as pitch. The additional aspects that we discuss later in this chapter revolve around the question whether perception of aesthetic dimensions of prosody and analogous features in music are independent of more traditionally studied acoustic features. Our analysis will contribute to a more complete picture of the fundamental aspects of human communicative behaviours in relation to music and emotion that have been hitherto overlooked in cognitive science.

Although scholars have reflected on the shared properties of music and language since at least the early eighteenth century, the parallel consideration of language and music within cognitive science has grown significantly during the last decades. At its heart is a new aim of understanding the neural mechanisms underlying these auditory experiences and of linking them thereby to

perceptions of emotional states and other communicative content. This research has employed a range of methodological strategies employing behavioural and electrophysiological measures, functional neuroimaging techniques and the study of brain damaged individuals (Patel, 2012). Knowledge regarding music and speech processing acquired through these studies can potentially lead to new models for the neurophysiological and cognitive organisation of such processes. One dimension of interest is the emotional quality of these auditory experiences. Here, we add an additional dimension termed "expressiveness" which captures the aesthetic quality of the individual performance of speech and music beyond its emotional content. We propose to explore various prosodic aspects of these auditory experiences, including emotion and expressiveness, to provide a more nuanced understanding of the listener's perceptual experience of music and speech.

Before considering the empirical evidence regarding the relationship between auditory speech and music perceptual experiences, we review the formal properties of these two domains and compare the perceptual features of speech and music as acoustic events. Both speech and music encompass acoustic streams that are perceived in terms of pitch, timing, loudness and the space in which they occur and variation across these characteristics bears information about their source of production (Griffiths, Flees & Green, 1999). For example, a range of higher pitches can be indicative of smaller size, as in a child's voice rather than an adult one or of a violin rather than a bass. Despite such shared acoustic components, they serve different functions in speech and music.

Researchers in the mid-twentieth century determined that in speech the expression of emotion is conveyed through a number of interacting prosodic cues that involve changes, not only in duration, but also in fundamental frequency (F_0), intensity and voice quality (Crystal, 1969). For example, Scherer described the rise of mean, range and variability of F_0 in "active" emotions such as anger, fear and happiness, while "passive" emotions such as sadness were characterised by a decrease in fundamental frequency (Scherer, 1986). As such, some universal ability to identify emotions in speech does appear to exist, but great variability has been found among speakers of different languages (Scherer, Banse & Wallbott, 2001). The perception of emotional expression in music through variations in pitch, rhythm, duration and tonal intensity has received much debate since the early eighteenth century. Many of the twentieth century experimental investigations were largely limited to "everyday" emotions corresponding to experiences labelled as "happy," "sad" or "angry" (see for instance Heilman, Bowers, Speedie & Coslett, 1984; Ross, 1981; Shapiro & Danly, 1985. See also Quiñones in this *Companion*). However, there is new interest amongst empirical researchers in "aesthetic" emotions that may be experienced in regard to an artistic production or the performer's skill (Juslin, 2013). The references to the literature reviewed here mainly correspond to everyday emotions, while the theory of expressiveness we propose relates to aesthetic emotions.

Music and language display somewhat divergent acoustic properties and different biological and cultural foundations, rendering the study of the listener's experience a challenging task. Cross also highlighted the differences in the state of research evidence in the two domains, drawing attention to the different sizes of historical and cross-cultural corpora that are available (Cross, 2010). While research into the universal aspects of language has been based on evidence arising from a wide range of cultures and time periods, Cross suggested that similar considerations of the possible universal properties of music are more problematic because the comparable body of evidence is much more limited when it comes to representing the cultural and historical diversity of musical forms, with most investigations focusing on the modern Western musical canon.

The language-music comparison also poses challenges from a biological perspective. Language acquisition appears to be constrained by maturational development that is sensitive to environmental input at different ages and stages. While there is evidence of a similar process of development for music cognition in infants, a similar critical period sensitivity has not been so far been demonstrated (Trainor, 2005; Trehub, 2001). From an evolutionary perspective, music has been hypothesised

to relate to social cohesion and well-being, preceding language evolution. For example, Dunbar points to the endogenous opioid release effect on our ancestors during communal singing which is thought to promote social cohesion (Dunbar, 2003). At the same time, singing is argued to be cognitively simpler when compared to the complex computational devices found in language, leading to the proposal that music is an evolutionary precursor to language. Such considerations that blend biological and cultural factors appear to be indispensable in the understanding of these human behaviours.

The considerations in this chapter are limited to evidence stemming from Western tonal and metred instrumental music, whose conventions do not necessarily apply to all existing musical systems. Whether our observations might hold more generally and therefore reflect more universal properties of music, must be validated through cross-cultural investigation. Similarly, current understanding of speech perception research reflects evidence from a limited number of languages and may not pertain to all linguistic systems. It is yet to be determined how cultural influences shape biological foundations for such auditory perceptual processes. At present, the parallel study of language and music, even within a given musical and linguistic system, is subject to the tension between cultural relativism and the search for empirically testable universals.

Seeking the Roots of a "Contemporary" Comparison

Although research investigating the relations between speech and music processing has intensified in recent decades, the link between the two human productions has been explored since ancient times (see Pelosi, Hicks, Prins and Gouk in this *Companion*). For example, with respect to rhythmic organisation of speech, the American experimental psychologist Thaddeus L. Bolton, in one of the earliest scientific studies in music education, suggested that specific rhythmic relationships did not arise naturally in speakers of Greek and Latin, but that they were developed as a result of the high value placed on the aaesthetic aspects of theatre performance of poetry and music in those cultures (Bolton, 1894).

There were also theoretical considerations of the comparisons between speech and music in ancient Greek scholarship. Aristoxenus, a fourth-century BC pupil of Aristotle, made observations of differences in how pitch is employed in speaking and singing. He noted that the movement from one pitch point to the next is continuous in spoken Greek (*syneches*), whereas, in singing, pitches are discrete (*diastematike*), becoming more stationary in comparison to speech (Anderson, 1973). This history reflects the musical presentation of verse in ancient Greece mentioned above. It is related to the ancient Greek "prosoidia," used to describe pitch variations in spoken poetry. This distinction is still relevant today, as individuals with neurogenic music deficits are shown to have greater difficulty in recognising pitch direction in discrete pitches even when these are artificially applied to speech stimuli (Liu et al., 2012).

Rhetoric encompasses the techniques employed by individuals trained to inform and to persuade. The art of rhetoric was not viewed as an aspect of spontaneous production but, rather, had to be practiced and mastered according to specific principles. Quintilian argued that a skillful orator must have a good understanding of music principles, thus explicitly drawing parallels to the properties of the two domains. Interestingly, technical terms describing speech prosody have etymological sources in music. For example, "accent" indicates the presence of acoustic stress and emphasis in speech. The English word is derived from the Latin *accentus*, meaning song added to speech; the stem *cantus* means singing.

In the Renaissance and the Baroque period, the relation between speech and music was a topic of great interest, especially in the qualities of successful communicative practice and the power to move the listener in both oration and musical performance. This debate about the relationship between music and rhetoric continued into the eighteenth century. Beyond the question of shared

qualities of music and speech in performance or in their essential compositional structure, there was also interest in considering their human origin from the seventeenth century onwards (Besson & Schön, 2003).

One very notable contribution to the understanding of the more physiological instantiations of music and speech as human behaviours was by the English physician Thomas Willis (1621–1675). In his book *Cerebri anatome* (1664), he developed an original neurological model for the physiological basis of music as motor expression, suggesting it was both natural and universal (Lorch, 2010). In the context of the Western Christian tradition, such a proposal regarding the mind would invoke an account of the human soul. Willis' major innovation was to detail the corporeal nature of the "sensitive soul," that along with the "vital soul," controlled sensation and motion, knowledge and simple reasoning. Willis theorised that both animals and humans had a corporeal sensitive soul, while humans also had an (immaterial and immortal) "rational soul." Willis further described a material link between them: the intercostal nerves, which he termed the "reins of the soul." By this means, the "passions" of the body were connected to the mind and through them, human actions could be directed by rational judgment (see Gouk in this *Companion*).

Willis's work is exceptional with regard to an extensive neurological treatment of music as a human behaviour which encompasses the passions and the rational soul. While describing the anatomy of "hearing nerves" and their connection to the brainstem, cerebellum and cortex, he also considered the neurological storehouse of the ideas of sounds and the process of remembering musical melodies. In his later *De anima brutorum* (1672) he noted that some young children are skilled singers before they are able to speak fluently. Moreover, Willis suggested that musical ability is distinct from other aspects of memory, reasoning or intellect. He believed that a physiological difference between individuals would explain why some have "musical ears" and others are "wholly destitute of the faculty of Musick." Finally, he considered the direct and profound effect of music on the "passions" in humans, but not animals and ascribed a physiological source to this difference (Willis, 1971[1664/1681], p. 97). Willis's treatment of the neurological basis of musical abilities appears to be unique in seventeenth-century neurological thinking. However, he did not develop parallel arguments for the neurological basis of language, nor did any others until the nineteenth century, although the nature of auditory perception and the effects of sound on mind and body had been considered since the Enlightenment (Gouk, 2005; see also Gouk and Kennaway in this *Companion*).

In the second half of the nineteenth century, theoretical ideas on the evolution of, and parallels in, music and language focused specifically on communicative and emotional expression (Darwin, 1872; Spencer, 1858), underpinning a renewed interest in determining the nature of the language and music faculties. The study of how brain damaged individuals responded to linguistic and musical tasks were seen as test cases for developing a general account of brain function and human behaviour in the nineteenth century (Johnson, Graziano & Hayward, 2010). In the 1860s, the English neurologist John Hughlings Jackson (1835–1911) drew a neurological distinction between what he termed "propositional" language and emotional vocal expressions, while his colleague Henry Charlton Bastian (1837–1915) began to routinely test musical abilities in patients with acquired disorders of language (Jackson, 1866; Lorch, 2013). Furthermore, the ability to hum or sing was noted to be preserved in some individuals with little or no spoken verbal expression (Lorch & Greenblatt, 2015). Behavioural observations of such patients led to the construction of theoretical models that explained how language and music processing might be instantiated in different parts of the brain. The French clinician Jean-Martin Charcot (1825–1893) provided some of the earliest detailed theories of how the brain processes music (see Kennaway in this *Companion*), developing an account of music processing that saw a parallel structure to his model for language and described the dissociations of deficits for both the perception and production of these two domains in his neurological patients (Johnson, Lorch, Nicolas & Graziano, 2013). The German neurologist August

Knoblauch (1863–1919) coined the term "amusia" to describe individuals with an impairment in musical abilities, in an analogy to the term "aphasia" defined two decades earlier to describe impairments in language (Knoblauch, 1888).

By the end of the century, many cases of impairments dissociating music and language had been collected and there were growing numbers of observations of both acquired and congenital music disorders (for instance Edgren, 1895), suggesting that they were viewed as having equal status as mental faculties (perhaps in contrast to today) and were demonstrated to be overlapping in function and vulnerability to impairment through brain damage.

In the second half of the twentieth century, there was a resurgence of interest in the cognitive basis of verbal and emotional expression with the advent of neuropsychological studies investigating laterality of function (Borod, Koff, Perlman & Nicholas, 1985; Gorelick & Ross, 1987). Behavioural research with brain damaged patients indicated that in aphasic individuals with left hemisphere damage the linguistic content of their speech production was impaired while their prosodic expression was intact. However, the reverse picture was shown in patients with right hemisphere damage. Those with difficulties in expressive speech showed a range of abilities to express emotional content by employing a variety of non-linguistic vocal resources. These intact channels of expression were thought to contribute to the aphasic individuals' conversational success even though their ability to convey meaningful content was compromised (Lorch, Borod & Koff, 1999). Furthermore, renewed interest in the preservation of the ability to sing in aphasic individuals led to models of distributed hemispheric processing of language and music and the development of such speech rehabilitation techniques as Melodic Intonation Therapy (Albert, Sparks & Helm, 1973). Developmental research investigating innate properties of language also considered the role of pitch and prosody in very young infants. This strand of research revived earlier nineteenth-century questions about the evolution and development of language with new models of the appreciation of melody as an underpinning for infant speech perception (Trehub, 1989; Trehub, Plantinga, Brcic & Nowicki, 2013).

Cognitive investigation of auditory experiences of music and speech expanded in the 1980s through the methodological innovations offered by computer-based manipulation and analysis of acoustic stimuli. However, the increasing use of more advanced technical manipulations in recent research may also be somewhat problematic. While the use of auditory stimuli with unnatural acoustic manipulations may be useful for investigating the auditory abilities of listeners, they may not be appropriate for research into individuals' music cognition (Bigand & Poulin-Charronnat, 2006). This observation calls for the use of more environmentally valid stimuli. In line with this view, examination of perception of "expressiveness" in music and speech requires the use of naturally-occurring stimuli, as it involves the genuine aesthetic appreciation of real auditory objects in the human environment.

At the beginning of the twenty-first century, there have been renewed efforts to explore the relations between speech and music (Ayotte, Peretz & Hyde, 2002; Foxton et al., 2004; Nicholson et al., 2003; Patel, Foxton & Griffiths, 2005). There is growing interest in the dimension of emotion with regard to acoustic expression. In a review of 104 studies of vocal expression and 41 studies of music performance, Juslin and Laukka found similarities in the accuracy of listener's ability to identify discrete emotions through emotion-specific patterns of acoustic cues in both vocal and musical stimuli (Juslin & Laukka, 2003).

With regard to the broader historical enterprise of determining the interconnections between language and music in the nineteenth century, Fodor's model of modularity has been instrumental in providing a conceptual foundation (Fodor, 1983), suggesting that the mind consists of modules that are domain-specific, informationally encapsulated; they are an innate endowment with neural specificity. Thus, different cognitive components function independently. Stimuli will engage a specific modular processor relative to their featural properties, while certain stimuli may be

processed by different modules depending on contextual variables. Much of this work has focused on the perception of pitch, which has been shown to be processed as either music or language relative to a given acoustic context. The processing of acoustic experiences by infants, for example, can be conceptualised as either music or speech leading to different hypotheses about the development of such modules (McMullen & Saffran, 2004). A variety of investigations regarding the processing of pitch have also explored such distinctions in healthy adults and those with developmental or acquired difficulties of speech and music (see Hallam in this *Companion*).

Pitch Differences in Speech and Music

Important differences in the structuring of pitch sequences in speech and in music must be considered when assessing the auditory perception of these sound streams. For example, a melody in Western tonal music relates to specific sets of pitches and the insertion of pitches that do not belong to a given set is perceived as incongruous by the listener (Steinke, Cuddy & Jakobson, 2001). The structural constraints for pitch and timing in music make it more predictable than speech. In contrast, the organisation of speech into pitch events does not exclude the use of some pitches in favour of others.

While pitch sequences in speech are continuous, they have a "stair-stepped" organisation in singing within the Western Classical music system (Bidelman & Krishnan, 2009). The transition from one pitch event to the next in speech can be understood as a smoother process compared to singing where the voice seems to "pause" slightly in every interval. This is even more pronounced for musical instruments, although some variation exists depending on the type of instrument and the mechanism that generates its sound. Another important difference between pitch across these two domains is the distance between pitch events. That is, as a melody unfolds, the interval types between successive notes differ from those of speech. In the Western musical tradition (before the 1950s), a semitone is the smallest interval encountered in notated composition and, at the same time, it appears very frequently. The pitch organisation of speech differs substantially and the occurrence of these small intervals is not as common. Moreover, pitch sequences in speech are characteristically perceived as simple rises and falls.

The relativistic nature of pitch variation in speech can be juxtaposed with the determined nature of pitch representation in music. For example, a small manipulation of pitch can lead to a complete shift in the mood or emotional quality of a music piece, turning a tune perceived as happy into a sad one, whereas in speech no such effect is common (McDermott & Oxenham, 2008). Thus, the appreciation of musical stimuli highly depends on precision in pitch (Zatorre & Baum, 2012). This difference in terms of accuracy can be explained through a principle of pitch organisation that exists in music but not in language, that of tonality. Musical key can be understood as a probability distribution that determines the frequency of appearance and the duration of notes in relation to other notes (McDermott & Oxenham, 2008). Hence, the various pitches belonging to a set are organised in harmonic relationships that determine which sequences are allowed, more "appropriate" or more important in any given tonal context. As such, pitch sequences in music can be thought of as organised around a centre of gravity that determines which parts of the sequence are more stable and which are less stable (Tillmann, Bharucha & Bigand, 2000).

Although juxtaposing music melody with the pitch contours of speech appears to be the most legitimate comparison to be made, evidence from Ross et al. suggests that the preference for specific tonal intervals may be linked to the formant properties of vowels in speech (Ross, Choi & Purves, 2007). Similar to the harmonics associated with musical instruments, formants constitute additional frequencies above the F_0 that, in the case of speech, vary according to different configurations of the vocal tract. Evidence presented by Ross et al. suggests that our preference for some intervals in music arises from the frequency relationship of the first two formants in vowels. This finding may

shed light on the origins of musical preference in humans, but also indicates additional complexity to the parallel study of pitch across music and speech domains.

Prosody in Language and Music: Parallels and Differences

The role of pitch is also pivotal in understanding how syntax is organised in music. Despite similarities found in cognitive experiments on the perception of syntactic violations in both music and language, there are structural differences in the two domains (Maess, Koelsch, Gunter & Friederici, 2001; Patel et al., 1998). Both language and music can be analysed as comprising small building blocks combined into larger structures governed by structural principles that define the relationship of each unit or phrase to adjacent ones. However, linguistic syntax has additional structural properties that have no equivalent in music, such as the morphological variants indicating lexical and grammatical functions for different parts of speech. For example, the English morphemes "-ing" or "-ly" have a very different componential status compared with elements such as "girl" or "red" in the phrase structure of an utterance. Another syntactic distinction is at the formal level, as music structure is not underpinned by predicate-argument relationships present in language. Parallel properties in musical phrasing are more difficult to identify.

Prosodic realisations in speech have been associated with functions for communicating syntactic, informational, interactive, attitudinal and emotional functions (Vaissière, 2008). More specifically, prosodic information can convey grammatical distinctions, such as indicating a question with a rising tone. Other prosodic signals may reflect conversational conventions, such as turn taking or concluding an exchange or speaker beliefs (for instance, truly believing in an idea or expressing disbelief and doubt). In addition, prosody may serve as a signal of speaker mood, emotion or affect with flattened prosody typically signalling sadness or depression (Alpert, Pouget & Silva, 2001). Three main prosodic categories are typically described in speech – linguistic, emotional and pragmatic. We will consider whether these prosodic labels provide a sufficient description of prosodic realisations in speech.

Beyond their basic grammatical functions, prosodic cues are also employed in order to emphasise syntactic structures or to disambiguate structures. Duration and pitch patterns as well as pausing help the listener to group words into constituent structures by identifying prosodic breaks (Wightman & Ostendorf, 1994). Manipulation of these features may also lead to varying degrees of emphasis or prominence (Skandera & Burleigh, 2005). Prosodic cues are also used to emphasise or disambiguate meanings. In contrastive stress prosody, the raising of pitch, duration or loudness may be used to signal a topic/focus. For example, in the utterance "John gave her flowers," the Subject "John" would typically be the topic and bear the main prosodic stress. In other cases the object "flowers" might be emphasised prosodically to indicate that this was unexpected, as in the context where the recipient was known to dislike receiving such a gift. Music prosody displays some similar use of prosodic force that facilitates the segmentation of an acoustic signal into smaller parts and places emphasis on important events (Palmer & Hutchins, 2006).

Prosodic features also reveal the emotional state of the speaker. As with linguistic prosody, emotional prosody also employs pitch and timing patterns to denote the speaker's emotional disposition (Pell, 2006). As speech uses emotional prosody in order to convey different emotions, a music passage can be executed with prosodic variation in order to communicate emotions (Juslin & Laukka, 2003). However, music does not normally have a semantic aspect. That is, in contrast to verbal symbols, which have denotative meaning, musical sounds typically do not carry explicit denotations but may express ideas through context (Meyer, 1956). Admittedly, exceptions such as onomatopoeic or leitmotif devices as used in symphonic poems and in opera certainly exist. These intend to convey description and narrative by employing sound symbolism or by relying on cumulative association. Music can also possess some general communicative force through its

emotional character. In this respect, a parallel can be drawn between music and speech prosody, as prosody carries information that extends beyond word identity and emotion in music has an attitudinal rather than a semantic meaning (Cowie et al., 2001).

A third type of prosody, pragmatic prosody, extends beyond basic syntactic and emotional signal functions but also by employing variation in pitch, duration, rate and intensity. A tone may be considered as ironic when the prosodic features in a given utterance appear in sharp contrast to those that would be typically expected in a pragmatically neutral utterance matching its literal meaning (Attardo, Eisterhold, Hay & Poggi, 2003). An analogy may be drawn between language discourse and music discourse. Particular musical devices, such as rhythmic relationships or harmonic progressions, can turn into formulas that promote efficient communication, evoking customary responses (Meyer, 1956). However, this parallel fades when adding the pragmatic dimensions in speech of interlocutors' beliefs, social identities and relationships that have no exact counterparts in the musical domain.

Language, Music and Cognitive Impairments

The study of music perception impairments is of particular interest for the understanding of the cognitive relationship between prosodic features in music and language (Patel, 2008). The following section reviews the evidence of how cognitive impairments can result in difficulties in the perception of speech and music sound streams. For example, pitch and its perceptual organisation from "low to high" is similar across speech and music and brain damage in the right, but not left, hemisphere can lead to impaired judgement of the direction of pitch changes in both linguistic and music stimuli (Johnsrude, Penhune & Zatorre, 2000; Meyer et al., 2002). In order to investigate prosodic features in larger speech streams, technical manipulations isolate the melodic and rhythmic content of a spoken utterance from its lexical semantic content. This precludes the engagement of cognitive mechanisms responsible for processing linguistic meaning. In one such investigation, Nicholson et al. reported that their participant with right fronto-parietal brain damage had equally compromised ability on both speech-like and music stimuli when lexical information had been removed (Nicholson et al., 2003).

In other studies, researchers have looked at the linguistic abilities of individuals with congenital amusia, a developmental difficulty with music appreciation and performance (Kalmus & Fry, 1980; Peretz & Hyde, 2003). These individuals feel less positive about musical experiences, often devote relatively little time to music listening, and some report experiencing more limited psychological changes in response to musical stimuli (McDonald & Stewart, 2008). Individuals with congenital amusia have severe difficulties with basic pitch appreciation (e.g., Ayotte et al., 2002; Foxton et al., 2004; Hutchins, Zarate, Zatorre & Peretz, 2010). The diagnosis of amusia is typically based on poor performance on tasks requiring judgements of differences in melodic and/or rhythmic patterns (Peretz, Champod & Hyde, 2003). This pitch difficulty has been shown to extend to the perception of speech patterns as well. However, Liu et al. suggest that congenital amusics' poor perception of intonation contours in de-lexicalised speech stimuli may be due to manipulations which caused pitch events to lose their gliding structure and acquired a more discrete nature causing the speech-based stimuli to be perceived as music (Liu et al., 2012). Correlations between musical pitch processing impairments and acoustic impairments in amusics have been found across a large number of studies but further inspection of individual cases point to several exceptions (Vuvan, Nunes-Silva & Peretz, 2015). It therefore appears that some experimental techniques may require additional refinements in order to avoid artefacts such as these from technical acoustic manipulations that may confound the relationship between speech and music.

The assessment of the musical ability of amusics based on a limited set of tasks examining the appreciation of differences in pitch, contour, interval, rhythm and metre does not take into

consideration an important aspect of music engagement and appreciation. In the following section, we present a prosodic aspect present in both music and speech. We argue that this prosodic dimension has a dynamic quality extending beyond those isolable acoustic features that have been systematically investigated in the literature.

New Avenues for Assessing Perception of "Expressiveness"

We argue that additional prosodic aspects of speech and music such as tone colour, phrasing and timing should be included in the neuroscientific inquiry into the listener's experience of a performance. Despite the systematic investigation of the perception of basic prosodic elements in individuals with compromised cognitive abilities over the past 50 years, this shared aesthetic prosodic dimension of music and speech has not yet been addressed in the cognitive and clinical domains.

In the present research context, we argue that while componential analyses of acoustic features have contributed a great deal to the understanding of music and speech cognition, they may overlook more dynamic aspects of the appreciation of human acoustic streams. We suggest that there are additional dimensions of prosodic expression that are not accounted for in the existing prosodic elements that have been investigated. Aesthetic appreciation of speech and musical acoustic streams includes the perception of qualities that go beyond aspects of emotion or structural well-formedness. We characterise a useful additional aspect of the listener's experience which will further the understanding of the acoustic properties embodied in the appreciation of music and speech as communicative systems. This novel approach encompasses additional elements of expression related to the dynamic gestalt-like qualities of acoustic phrases that conveyaesthetic properties in speech and music. Here we define this additional prosodic aspect as "expressiveness" and this term will be used throughout this section.

Studies on soloists' interpretation of pieces of music identify such aspects of prosodic expression (Repp, 1995). Each soloist will play in a distinctively different way from the same textual source. Even if their technical profile (fingering, muscle control etc.) is equal to other musicians with the same level of proficiency their performances will inevitably vary. These differences may be due to the degree that a particular acoustic effect is employed by a given performer or how these acoustic cues are combined. Hence, choices in interpretation are not identical. This is evident in pianists who employ different styles of expression that can be perceived as differentiating their individual performance from others (Sloboda, 1983). This suggests that despite some generally accepted constraints that govern soloists' performance, a great deal of their rendition reflects personal choice. When studying soloists' performance of the unmeasured prelude, where durations are not notated, Gingras et al. found performers to exhibit large variation in expressive timing around parts of structural unexpectedness (Gingras et al., 2016). This finding suggests that when duration is not determined by a music score, performers are likely to produce a wide range of patterns of expression. Such choices cannot be deemed as right or wrong, but as more or less preferred (Palmer & Hutchins, 2006). Although identifying the particular component parts that comprise these variations in performance might seem hard to determine, this is easily contrasted with the sound of more "neutral" performances, such as those coming from music notation playback sound files which lack temporal deviations, loudness variation and timbre changes. This opens up new methodological opportunities for a systematic consideration of such differences, which are well recognised in performance studies, but overlooked in the cognitive science of music.

A "deadpan" performance can be thought of as the least possible expressive and "emotional" performance. In such a performance, all notes correspond to the exact durations imposed by the score while their loudness displays absolutely no variation across a piece of music (Sloboda, 1983). In speech, a deadpan style of speaking might include little variation of prosodic features in comparison to a dramatic performance. In a closer analogy to various renditions of a given music score,

an inexperienced actor's literal and conventional rendering of the text will contain little prosodic variation in comparison to an experienced and talented actor playing the same role who will use a variety of prosodic manipulations to embellish the words of the playwright. This captures the aesthetic dimension of prosodic variation in speech and music perceived by the listener. The question is what perceptual mechanisms are involved in appreciating such differences that seem to be fundamental to the qualitative experiences of music and speech streams.

It is of interest to examine possible reasons why some elements or "techniques" used in speech are perceived as expressive. For instance, deviations from temporal regularity in music can be perceived as musically expressive (Large & Palmer, 2002). In language, although there are minimal constraints on pitch, intensity and duration variation beyond which utterances will sound distorted, there is no such thing as temporal regularity or a default rhythmic structure. Rather, those who attempted to capture isochronic dimensions of speech in typological classification systems have often based their determinations on listeners' impressions rather than objective acoustic measures of speech (Roach, 1982). However, even in music Fitch notes that isochronicity is a relative feature, as no music is shown to be completely isochronous (Fitch, 2006). One could argue that deviation from temporal regularity in music might be perceived as expressive, due to its speech-like quality. That is, the intentional deviation from the assigned rhythm would perceptually resemble speech where no such restrictions exist. As speech rhythm does not have prescribed organisation – in contrast to metre in Western tonal music – it might represent a freer form of expression. For this reason, a musical interpretation that shifts away from faithfully following its measure might represent the performer's intuitive choice to mimic speech prosody.

In language, it is also useful to consider the written representation of the sentence and its acoustic realisation in a spoken utterance. If a text is read aloud, there is the potential for a wide range of variation in suprasegmental features of the oral production. The acoustic realisations of a written sentence are only limited to a very minor extent by syntactic and discourse pragmatic constraints, signalled to a small degree by punctuation. However, a wide range of emotional and social information is also conveyed by individual utterances. There has been only limited exploration of such aspects of the acoustic signal within the domain of linguistics, although this has been long recognised to be a significant factor in the dramatic arts. Various studies have documented the unpredictability of acoustic realisation of written language in terms of durational patterns of syllables or pauses (Brown & Miron, 1971; Ferreira, 1991; Gee & Grosjean, 1983). Hence, although syntactic rules are specific and describable, the acoustic properties in the oral rendition of sentences displays richer acoustic elements than those that can be predicted based on the prosodic-syntactic relationship.

It does appear that listeners can and do appreciate and distinguish between various expressive renditions on an aesthetic level, which is not simply to do with emotional content. This suggests that comparisons at the level of expressiveness need to be sought across domains, but also in relation to other perceptual processes that have already been systematically explored with regard to prosody. In a recent study we showed that congenital amusia does not necessarily deprive an individual of the ability to appreciate aesthetic aspects of music (Loutrari & Lorch, 2017). We tested one individual diagnosed as congenital amusic and found that she was able to perceive expressive features of music and speech prosody, differentiating expressive from non-expressive melodies. The two melody categories differed simultaneously in several acoustic features: temporal regularity versus slight deviation from it, variation in dynamics versus uniform dynamics and connected transitions between notes versus heavily accented notes. Our participant scored normally on this task despite severe difficulties with pitch perception. Such dissociations in performance raise questions regarding the evaluation of components of music cognition in current amusia research. We suggest that examining the perception of expressiveness in individuals with congenital and acquired music impairments can contribute substantially to our picture of music cognition and its disturbances.

By including consideration of expressiveness in the investigation of music and language cognition, we suggest that new associations and dissociations in individuals with amusia may be identified. This approach can cast some light on the relationship of expressiveness to the perception of other aspects of the acoustic sound stream that have previously been the focus of research. The future objective should be to develop a clearer determination of the nature of expressiveness and to explore whether it should be considered a single perceptual entity or depends on a collection of acoustic features yet to be determined. This will lead to a more nuanced picture of the individual listener experience of such socially mediated auditory stimuli as comprised in music and speech. Further questions regarding the extent to which expressiveness is a construct determined by culturally specific traits and/or has underlying universal principles can add to our understanding of the nature and origin of this channel of human expression.

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MUSICAL ENGAGEMENT AND WELL-BEING IN THE EARLY YEARS OF LIFE

Beatriz Ilari

Introduction

In recent years, a solid body of knowledge on music, mind and well-being has emerged. Confirming some ancient ideas about music's potential, researchers from varied fields have been providing evidence of the "effects" of music on the human psyche and body. Yet, a closer examination of the extant literature reveals a gap in our knowledge concerning music and well-being in childhood. This is particularly true in the early years of life (birth to age eight, as in the UNESCO definition of early childhood), as well as in children who are considered to be in good health and "thriving." There are many reasons for this state of affairs including the complexities inherent in researching young children's musical engagement and well-being.

Studying musical engagement and well-being in the early years of life is challenging in many ways. First and foremost, there is the problem of methodology. Examining babies' and young children's engagement with music is, in and of itself, a daunting task and one that is further complicated by the addition of well-being as an area of interest (Ilari, 2014; Trehub, Hannon & Schachner, 2010). The primary method used to study well-being, in and through music, is the self-report, which is not applicable to the early years of life, when children are still developing linguistic, cognitive and socio-emotional skills (see Lee, Krause & Davidson, 2017). With the exception of reports on physiological data, studies on young children's musical engagement and well-being are typically based on observations and assessments made by an external observer. As important as they are, findings from these studies are limited in that they may not represent children's ideas and emotions in full. A second challenge refers to the lack of agreement on the definitions of young children, music, musical engagement and well-being, which are all contested terms (Ilari & Young, 2016). There is also a general lack in the recognition of young children as musical agents despite the widespread view that humans are predisposed to engage with music from very early on (see Custodero, Cali & Diaz-Donoso, 2016; Dansereau & Ilari, 2017). This occurs, in part, because the field of music – and particularly Western "art music" from which the field of music education derives – continues to be dominated by images of the expert performer and composer. Young children, therefore, tend to be viewed as "miniature adults undergoing a process of becoming," instead of being assessed where they are at physically, mentally and emotionally as agents "in a process of being" (James & Prout, 1997). A fourth and final challenge is the problem of defining

well-being in early childhood music research and practice. In the field of early childhood music, well-being is sometimes taken as a given and often left undefined.

My aim with this chapter is not only to problematise young children's musical engagement and well-being, but also to review and situate current research from diverse fields within the same theoretical framework, which, to my knowledge, has not been done before. No review of the literature concerning music and well-being in young children was found at the time of writing; hence my aim to produce a review that could serve as a point of departure for future research. In this work, I embrace the view of young children as undergoing a process of being and concur with the idea that babies and young children are natural musical agents, given their predisposition to engage with music (Custodero et al., 2016). I also subscribe to Small's view that music is not a "thing to be learned," but is rather a form of action or "musicking" (Small, 1998). Key to Small's concept of musicking are two central principles: (1) the idea that musical engagement occurs through listening, performing, composing or moving; and (2) the view that the relationships between participants as they engage in music, as well as the meanings that they derive from it, are of utmost importance (see also Hara & DeNora in this *Companion*).

Given its relational nature, the concept of musicking aligns well with the view of musical engagement in the early years as a form of participation (Rogoff, 2003). Children develop in and through music by participating in the musical activities of their surroundings and with varied companions, including families at home, teachers, caregivers and peers in daycare facilities and preschools, therapists in clinical settings and other members of their communities (Young & Ilari, 2012). Thus, musical engagement is defined here as a moment in time when a child is actively involved in music (i.e., musicking), alone or with others, in everyday life. Musical engagement may be self-initiated or initiated by a companion – a carer, a teacher, a sibling, a peer, a therapist – or motivated by a sudden interest in a sound that is occurring in the environment like music emanating from a hidden loudspeaker. It may also be reactive (i.e., in response to sounds made live or recorded sounds) or deliberate, as when teachers and therapists guide a lesson or session (Young & Ilari, 2012). Young children's musical engagements in everyday life are often extemporaneous, varying as a function of their substitute for motor, linguistic, cognitive, social and emotional development.

Well-being, in turn, is a complex concept that has been defined in multiple ways, as one can see in the different chapters presented throughout this *Companion*. As noted, well-being is often taken as a given in research concerning musical participation in the early years of life; there is often a tacit assumption that by simply engaging in music, young children naturally experience well-being. This is obviously reassuring for music practitioners and researchers, but is this always the case? Are there situations in which music may, in fact, hinder young children's well-being? What have we learned so far and what are we yet to learn about early childhood musical experiences and well-being? In addressing these issues, I first describe Roberts's "wheel of well-being," and then use its four components as a platform to review existing research – including my own – on young children's musical engagement (Roberts, 2010, 2014). I end the chapter by discussing some of the limitations of current research and offering suggestions for future work.

Theoretical Framework: The Wheel of Well-being

Well-being has been conceptualised in multiple ways. Maslow's seminal work in the 1940s and 1950s, particularly his motivational hierarchy of human needs, was very influential as it set the stage for the development of a field known today as positive psychology (Hargreaves & Lamont, 2017; Maslow, 1943). In recent years, important work has emerged in this field, including Csikszentmihalyi's flow theory and Seligman's PERMA model of psychological well-being (Csikszentmihalyi, 1990; Seligman, 2010). Flow refers to an optimal psychological state in which an individual is completely immersed in an intrinsically motivating activity. When in flow, challenges and goals are matched,

action and thought are merged, hours go by in minutes and concerns about the self are usually absent (Csikszentmihalyi, 1990). Flow theory has been extensively studied by music scholars, including those whose research focuses on young children's musical engagement and is discussed later on in the chapter (Custodero, 2005). The PERMA model, in contrast, is only beginning to attract the attention of music researchers (e.g., Croom, 2015; Lee et al., 2017; see Lamont in this *Companion*). The acronym PERMA refers to the five main components of well-being, namely, positive emotions, engagement, relationships, meaning and accomplishment, that were proposed by Seligman. Aside from contributing to well-being, each component is pursued for its own sake and can be defined and measured independently (Seligman, 2010). Although promising, the PERMA model does not offer any explanations concerning developmental processes, which make its application to an understanding of young children's musical engagement less obvious (Hargreaves & Lamont, 2017).

More suitable to situating the musical experiences of babies and young children, Rosemary Roberts's model of holistic well-being combines elements of cognition and affect related to the everyday lives of young children in a developmental perspective (Roberts, 2010, 2011, 2014). Roberts argues that the common tendency to view the four main components of child development – emotional, cognitive, physical and social – as separate is problematic because it conveys a fragmented view of children's lives. To avoid this fragmentation at least in part, Roberts defines well-being as "feeling alright in yourself and with other people and reasonably 'coping'; the extent to which your agency, belonging-and-boundaries, communication and physical health are both well enough developed and in balance" (Roberts, 2010, p. 191). This definition includes four main components of well-being – described as "constructs" in her theory – that are the pillars of her work, three of which incorporate elements of cognition and affect. Analogous with Maslow's motivational theory of hierarchical needs, the four interrelated components are represented in a pyramid, as depicted in Figure 19.1 (Maslow, 1943).

At the bottom of the pyramid is physical development, which Roberts considers to be a foundational component. Physical development has two main sub-components: (1) health and development and (2) the physical environment of well-being. The first sub-component refers to elements such as eating, sleeping, motor skills and control and health routines. Sub-component two relates to contextual issues associated with children's well-being, namely, family income, housing situation and the local environment surrounding the child.

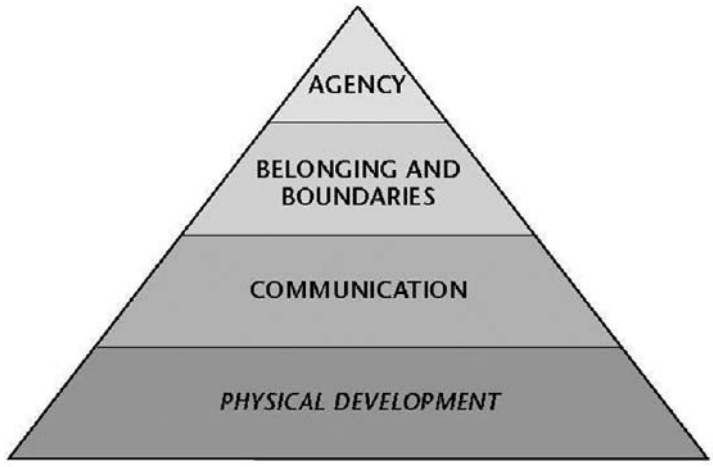

Figure 19.1 Roberts' components of well-being (2014)

At the next level of the pyramid is communication. Roberts views communication as a situated process that underpins affective, cognitive and social functioning. She argues that communication "is not just about conversations between people but about all connections made with the world, using all the senses" (Roberts, 2010, 2014, p. 380). The communication component is further divided into two sub-components: (1) received communication through all the senses and (2) expressed communication through a plethora of elements like spoken language, drawings, visual representations, stories, songs, movement and body language, to name a few. This view of communication as multisensory and multimodal aligns well with the notion of music perception and cognition as being embodied, which will be discussed later.

The other two components, belonging-and-boundaries and agency, are associated with states of well-being. In close association with Bowlby's theory of attachment, belonging in this case refers to the level of attachment between companions, the sense of belonging to a place and group and the sense of identity in relationship to others (Roberts, 2014). For Roberts, boundaries are understood as by-products of belonging. She defines them as "respect for people and places, awareness of expectations, familiarity with rules, understanding reasons for boundaries and self-regulation" (Roberts, 2014, p. 380).

Belonging-and-boundaries and agency obviously intersect. Whereas the first one delineates the external world from impact interactions, the second refers to the internal one. Agency is understood here as a driving force for thoughts and actions; as the ability to take action and respond to challenges with the aim of impacting one's surroundings – individually and collectively. It is also the capacity to make choices and to act upon them. That is, agency fosters dispositions toward positive learning.

Roberts' model is based on these four interconnected components of holistic well-being in child development. These components intersect in multiple ways as children navigate different "worlds" of family, school and community in everyday life. Building on Bronfenbrenner's bioecological model, Roberts situates each component within the different systems – micro, meso, exo and macro – that influence child development (Bronfenbrenner, 2001; Roberts, 2014). The microsystem is the closest to the child and represents direct influences from the home, the school and from community groups. The bi-directional musical interactions between a child and a carer are situated at the microsystem level (Addessi, 2009; Ilari, 2009). Triadic interactions between children, parents and teachers, in turn, are situated at the next level, the mesosystem. At the exosystem are the spaces

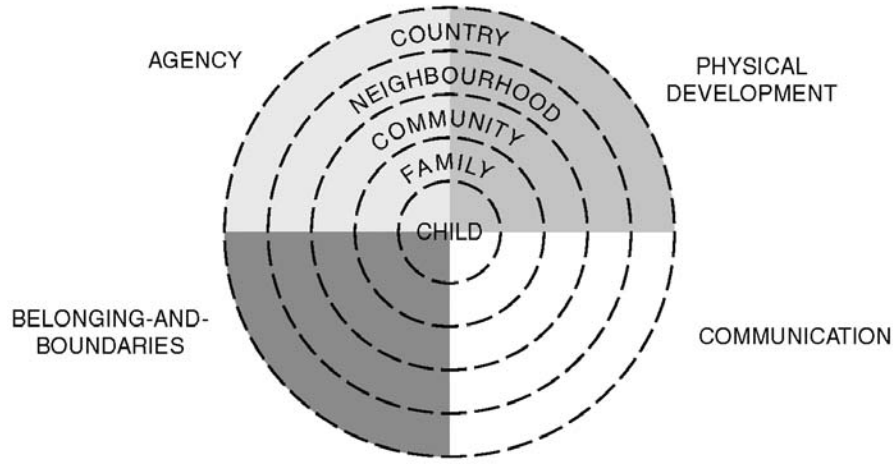

Figure 19.2 The Roberts wheel of well-being (2014)

and experiences that do not relate directly to a child, but that affect the adults surrounding the child and consequently, the child's life (e.g., parental employment situation). Finally, the macrosystem refers to the larger cultural context that influences the child including attitudes, expectations and ideologies (Bronfenbrenner, 2001). A schematic representation of the wheel of well-being is presented in Figure 19.2. Using the wheel of well-being and its four components as a theoretical framework, I now turn to the examination of research concerning musical engagement in babies and young children.

Four Components of Well-being and Young Children's Musical Engagement

Physical Development

It is common knowledge that children's brains and bodies undergo substantial changes at the beginning of their lives. In a very short time, the fragile newborn, who used to rely primarily on reflexes to respond to the world, becomes a competent "mover and shaker." In terms of musical behaviour (in the widest sense), this can be seen when a baby, who could barely move, begins to display an ability to move its head toward a loudspeaker in response to a sound or when a preschooler begins to synchronise her drumming to the underlying beat of music (Ilari, 2014; Kirschner & Tomasello, 2010). Musical skills such as pitch and rhythmic perception, singing and entrainment develop in leaps and bounds during the early years of childhood and are impacted by children's formal and informal musical experiences (Ilari, 2014; Trainor & Corrigall, 2010). The latter also influence the development of young children's attention, cognition and memory as well as brain structures (Fujioka et al., 2006; Putkinen, Tervaniemi & Huotilainen, 2013), As an example, in an on-going longitudinal study that has been tracking cognitive, brain, socio-emotional and musical development in children who began to learn music or sports at the ages of six to seven, we found micro and macroscopic brain differences in child musicians following two years of music education (Habibi et al., 2017).

The relationship between musical experiences and children's physical development has also been studied through meticulous work in music therapy, where music is used as a means to achieve non-musical outcomes. Music therapy has been central to the development of motor skills and control, social skills and health routines in young children, with and without disabilities. In the case of young children, music has been used to promote independence in the school routines of autistic children and to help diminish the perception of pain in hospitalised children (Barrera, Rykov & Doyle, 2002; Kern, Wolery & Aldridge, 2007). In the case of babies in neonatal intensive care units, controlled musical interventions have generated positive effects in terms of stabilisation of oxygen saturation levels, reduction of stress, promotion of non-nutritive sucking and caloric intake and aided the developments of sleep patterns in premature infants (Loewy et al., 2013; Schwilling et al., 2015). It is interesting, though, that so little research exists on the effects of music on sleep in the early years beyond the neonatal care unit, despite extensive discussion of the function of caregiver singing – lullabies in particular – in inducing sleep across cultures.

Likewise, little research to date has focused on the second component of physical development, including socioeconomic issues and housing arrangements. Although there are some exceptions, most research on young children's musicking reflects the field of psychology with its tendency to focus on what Heinrich et al. called WEIRD populations (i.e., **W**hite, **E**nglish speaking, **I**ntelligent and from **R**ich and **D**emocratic societies) (e.g., Andang'o, 2009; Gluschankof, 2008; Heinrich, Heine & Norenzayan, 2010). Within these populations, music research has typically centred on more affluent children. The assumptions that young children are naturally endowed to engage with music and that musical engagement may impact children's bodies, minds and brains have not been fully examined in non-WEIRD populations.

Communication

In the beginning of life, children's learning and development takes place primarily at the microsystem level (Bronfenbrenner, 2001). The musical elements surrounding the child stem primarily from maternal singing and speech (Trehub et al., 2010). The communication between mothers and infants is of a musical nature and it displays overlaps between speech and song. Malloch and Trevarthen have used the term proto-conversation to describe the "musical dialogues" that occur early in life (Malloch & Trevarthen, 2009). These musical dialogues have the purpose of fostering maternal attunement toward the child and secure attachment in infants (see Addessi, 2009). In short, they bring mother and child closer, paving the way for the development of a sense of belonging, which is another component of the wheel of well-being (Malloch & Trevarthen, 2009; Roberts, 2010, 2014).

Somewhat distinct from proto-conversations, in which features of music and speech may overlap, two other forms of relevant communication through sounds are infant-directed speech or *motherese* and infant-directed singing or IDS (for overlaps of music and speech, see also Loutrari/Lorch in this *Companion*). They are equally powerful in eliciting positive emotions in young children and their carers. These forms of speech and song are different from adult-directed versions, as they employ a higher vocal register, an elongation of syllables or long notes and a loving tone (Trehub et al., 2010). Babies not only respond to these forms of speech and song with heightened attention, but also regulate their behaviours based on some of their elements like rising or falling contours, tempo variation and vocal timbre. Infant-directed speech and song are ubiquitous.

The pervasiveness of infant-directed singing across cultures and time has been linked to evolutionary fitness (Mehr & Krasnow, 2017). This is in line with the widespread notion of singing to infants as a "natural" or intuitive parental/caregiver behaviours. Carers quickly learn to use music to regulate their infant's mood and behaviour, adopting different types of songs to play and arouse or induce sleep (Ilari, 2009). Lullabies, nursery rhymes and action songs (e.g., *Itsy Bitsy Spider*) are child-directed repertoires that carers share with their little ones. Carers also sing songs of varied genres with their infants, often inventing their own and creating parodies of existing songs. As an example, in an earlier study of Canadian mothers and infants, I found a great variability in the quality of their musical experiences. One mother suffering from post-partum depression found in the music of Georges Brassens a way to reconnect to her own happy childhood memories and bond with her daughter; another mother negotiated her own beliefs about appropriate music with the emotional responses of each of her four children to different repertoires (Ilari, 2009). What these cases suggest is that there is a dynamic interplay in the musical experiences that take place in the home, with both children and carers offering input through verbal and non-verbal responses to different repertoires. Over time, these "negotiations" give rise to family musical rituals and eventually, a musical culture of the family (Boer & Abubakar, 2014; Malloch & Trevarthen, 2009). An underlying assumption of family rituals is that they may promote a sense of belonging and hence well-being even though this has not been fully substantiated.

Aside from vocal communication through proto-conversations and singing, young children also use music as a means for communication, to perceive, to learn and to express emotions and ideas when engaged in music, as influences beyond the microsystem become more prominent in their lives (Bronfenbrenner, 2001). As an example, music is commonly used in preschools to teach extra-musical concepts, including literacy (e.g., ABC songs) and numeracy (e.g., counting songs). Young children are known to be receptive to these and other repertoires, a behaviour described as "open-earedness" (Hargreaves, 1982). In terms of expression of emotions and ideas through music, young children are known to invent their own tunes as they go about their daily lives (Ilari, 2014). Early in life, a baby's vocal production is shaped through exposure to the sounds heard within the family realm. Toward the second semester of life, babies begin to engage in musical babble, a behaviour that

is often described as the genesis of human song (Barrett, 2006; Tafuri & Villa, 2002). Musical babble undergoes transformation over time; first it begins to resemble the sounds found in the Western system. Next, melodies begin to display some level of tonal and rhythmic organisation, followed by different degrees of sophistication. Although some have argued that invented songs begin to disappear around the age of seven, this has been recently contested (Ilari, Fesjian, Ficek & Habibi, 2017).[1]

As regards the functions of music, young children use both invented and existing songs to communicate everyday intentions, ideas and emotions as they learn about the world. Sometimes, music is used for children to regulate their own emotions, to combat boredom or fill in a gap left by the absence of social interactions. Other times, music affords children with opportunities to commit small "acts of subversion" as when they sing songs or parodies about taboos like body functions (Ilari, 2017). These small acts of subversion may occur alongside the singing of existing songs in varied places like the home, school and community spaces (Custodero et al., 2016). Musicking in this context is an expression of the young mind and heart. Through these performances, young children communicate emotions, express identities, exercise agency and a sense of belonging to a community and culture (see Ilari, 2017).

Belonging and Boundaries

Music is, above all, a social endeavor (Ilari, 2016; Small, 1998). The studies discussed so far provide evidence that the intimate, communicative musical experiences of babies and their caregivers are relational in nature, much in line with the central tenets of musicking (Small, 1998). As children move between babyhood and the preschool years, their social circles gradually expand; in terms of Bronfenbrenner's model of 2001, this means that they move from the microsystem "outwards" (see Figure 19.2). An ever-expanding and increasingly complex social web of family members, extended kin, teachers, other caregivers, friends and community members, emerges in the life of the young child, who is now faced with new social demands and interactions.

Social interactions are the engagement of two or more social actors in a complex, co-regulated social pattern, wherein the autonomy of each actor is maintained (Ilari, 2016). Social interactions are not only key to the emergence of a sense of belonging, but also give rise to social cognition or "the group of processes that allow individuals to understand the emotions, intentions and actions of others and with others" (Ilari, 2016). Social referencing, joint attention and joint action are three building blocks of social cognition that are clearly seen in young children's engagement with music. Babies learn considerably through social referencing or from watching others without having to go through the experiences themselves. Joint attention refers to the capacity to share attention with another person toward a same object, person or event, as it relates to the ability of understanding intentionality behind actions. Tomasello and colleagues have coined the term "shared intentionality" to describe interactions of a collaborative nature wherein psychological states and goals are shared and actions are co-ordinated toward the achievement of shared goals (Tomasello et al., 2005). Shared intentionality not only supports cultural transmission and learning, but is also said to foster the emergence of co-operative behaviours in music and dance (Kirschner & Tomasello, 2010). Kirschner and Tomasello argue that, as humans engage in collective musical practices, they may perceive their co-performers as members of their in-groups. Joint action, in turn, results from social interactions where actions of two or more individuals are co-ordinated in time and space and modify the environment.

Rhythmic entrainment, a form of emergent joint action related to music that has received considerable attention, refers to "the process in which the rhythms displayed by two or more phenomena become synchronised, with one of the rhythms often being more powerful or dominant and capturing the rhythm of the other" (Clayton, Sager & Will, 2004, p. 10; see also Lamont in this *Companion*). Collective musical experiences are predicated on the existence of entrainment,

wherein co-performers entrain their voices and bodies to a common beat. Entrainment develops over the course of time. Babies do not typically entrain to the musical beat, as this skill usually emerges around later toddlerhood and the preschool years, becoming more robust over time (Kirschner & Tomasello, 2009).

Aside from the temporal component, there is also an affective component to entrainment (Phillips-Silver & Keller, 2012). When humans play music, dance or sing in groups, they share emotional states and form interpersonal bonds, developing a "sense of togetherness" (Cross, 2005). Music is the enabler in that it offers humans opportunities to entrain with one another, strengthening interpersonal bonds and promoting prosocial behaviour or voluntary actions that benefit others (Eisenberg & Spinrad, 2014) in babies and young children (Cirelli, Einarson & Trainor, 2014; Kirschner & Tomasello, 2010). Interestingly, studies that found prosocial effects of musical engagement in children have often focused on short-term musical experiences, raising the question whether such effects are temporary (state) or may be more long-lasting (trait). In my most recent work, I have been examining these issues by studying the potential "effects" of formal music learning on children's prosociality. We investigated the associations between participation in "Mummy and Me" music classes for varied periods of time and displays of prosociality of middle-class children. Children (3.5-year-olds) were invited to play a prosocial game based on a narrative of three animals. As the story unfolded, they were invited to take part actively in situations that involved instrumental helping (i.e., helping someone achieve an action-based goal) and sharing toys with the researcher. Results suggested that participation in early childhood music programmes was correlated with helping but not sharing behaviours. Taken together, these studies align with the idea that collective musical experiences may help children build and sustain positive relationships with the people around them. Such experiences are key to the development of a sense of belonging to a family and to a community.

As Roberts suggests, the development of a sense of belonging brings with it a sense of boundaries (Roberts, 2011, 2014). Participation in early childhood music education, for example, has been associated with the development of self-regulation in 2- and 4-year-olds (Winsley, Ducenne & Khoury, 2011). Knowledge of musical repertoires, in turn, aids in the construction of children's group boundaries as music is a classificatory practice. Very young babies (i.e., 5-month-olds) have shown attentional biases – or preferences, as psychologists often call them – to adults who sang familiar as opposed to those who sang unfamiliar songs (Soley, 2012). Likewise, preschoolers (i.e., 4-year-olds) indicated that they would prefer to be friends with a child who shared their musical knowledge (i.e., knew a song) as opposed to one who did not. What these works suggest is that young children are already learning social distinctions through music. By familiarising themselves with specific musical repertoires and practices, they are developing concomitantly their sense of belonging and their notions of boundaries. That is, music is one of several types of communication that foster belonging and social boundaries.

Agency

Although the research outlook is gradually changing, there is still a considerable gap in our knowledge of children's agency as it relates to music. Compared to their older peers, babies and young children have typically received less attention from music scholars (Dansereau & Ilari, 2017). The lack of research in this area is likely associated with conceptions of children and childhood in relationship to the being-becoming duality (James & Prout, 1997). Studies of musicking in the early years have often held adult abilities as the "golden standard," with young children perceived as undergoing a process of "becoming" (Ilari et al., 2017). In recent years, however, babies and young children have been recognised as musical agents, who are living in the moment and undergoing a process of "being" (for a discussion see Hargreaves & Lamont, 2017). This "new" way of thinking obviously influences our conceptions of children, childhood and musicality and also helps to reframe

the concept of agency in the early years. Agency is now viewed as a relational act that refers to one's ability to transform the realities of those around them and therefore, their own. Agency is also related to young children's will. Both Gottlieb and Smorholm exemplify this through the relationship between an infant and his or her primary caregiver to substantiate their arguments (Gottlieb, 2002; Smorholm, 2016). Far from being passive, this dyadic relationship is not only marked by interdependency, but is also shaped by a certain degree of social vulnerability (Smorholm, 2016). As an example, when a mother or caregiver sings a song to or engages in a musical dialogue with a baby, the latter might respond with coos, cries and subtle body gestures. The baby's embodied response signals to the mother whether the child is content, hungry, excited, tired or bored, thus effecting her subsequent response.

Opportunities to exercise their sense of agency emerge as children create, select, transform and even reject specific repertoires and practices, which translate into varied ways of being in the world. Aside from the dyadic relationship between child and carer, agency is clearly identified in settings where children are free to explore with instruments and sounds. The Pillsbury studies conducted in California in the 1930s and 1940s, for example, offered important glimpses of preschoolers' musical agency, perhaps for the first time (Moorhead & Pond, 1941). Since then, a plethora of works have surfaced on babies' and young children's agency through spontaneous music making in homes, schools, community spaces, as well as in spaces in between (Custodero et al., 2016; Gluschankof, 2008; Ilari, 2017; Ilari & Young, 2016). These works often fall within the category of musical play or self-initiated musical activities that are intrinsically motivated, engaging, enjoyable and controlled by children themselves (Marsh & Young, 2016). Combining kinesthetic, auditory and visual elements, musical play is multimodal in nature and involves a great deal of agency on the children's part. Research on musical play raised young children to the category of musical agents, bearing implications for discourses of well-being (Custodero et al., 2016).

Musical agency in the early years is also linked to flow experiences. When in flow "people are so involved in an activity that nothing else seems to matter; the experience is so enjoyable that people will continue to do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1990, p. 4). The emergence of flow depends on the existence of clear goals, immediate feedback, balance between challenges and skills, merging of action and awareness, temporary loss of awareness of the self, modified sense of time (hours go by in minutes), etc. Music lends itself naturally to the study of flow, as it offers opportunities for individuals, children and adults alike, to create form and generate meanings by means of skilled actions (Custodero, 2005). In a carefully designed study, Custodero observed three flow indicators – challenge seeking, challenge monitoring and social context – in groups of babies, toddlers and children (aged five to eight) that were attending different music education programmes. Flow indicators were observed in all groups, providing evidence of a link between music-making and well-being in early childhood.

Young Children's Musical Experiences and Well-being: Where Do We Go From Here?

My aim with this chapter was to problematise young children's musical engagement and well-being, to review and to situate current research from diverse fields within the framework of Roberts's wheel of well-being. This theoretical model can be useful for practitioners and researchers alike in that it allows one to position children in a process of "being," with much attention to the enabling contexts of well-being. Roberts's model highlights areas that have been traditionally studied by music scholars (e.g., communication), whilst including areas that have received comparatively less attention despite being equally important (e.g., agency). This is clearly another strength of the wheel of well-being model. Yet I would be remiss if I did not address some of its limitations. The main strength of Roberts's model is also its main weakness. While the degree of overlap between the four

components of the model offers a holistic view of well-being, it also makes it difficult for researchers to study each component separately. Second, the model does not have much to say in terms of cultural influences. That is, the issue whether different cultural groups would place more emphasis on specific components over others, still needs to be substantiated.

Formal and informal music learning were given equal importance in my definition of musical engagement throughout this chapter. But this should not be interpreted as a lack of consideration of the differences between these learning contexts. As Young and Ilari contend, there are different levels of intention in learning – implicit, reactive, deliberate – , each bearing different implications for debates of well-being. That is, how music exists in the life of a child along with the musical expectations that parents and caregivers may hold for their children, are likely to affect children's musical engagement and, therefore, the well-being that they derive from it. This needs to be taken into consideration in future investigations (Young & Ilari, 2012).

Along the same lines, future research and practice needs to consider how young children's states and dispositions to engage with music may have an impact – positively or negatively – on the components of well-being proposed by Roberts. For example, while music has been used successful in NICUs, some have called for more research before it can become routine in hospitals, claiming that it is not known whether musical interventions can reduce hypoxia (i.e., oxygen deficiency) in premature infants (Allen, 2013). In homes and schools, young children usually signal to their companions the musical repertoires and practices that they do not want to engage with. While it is difficult to pinpoint the exact music features that may account for children's "lack of interest" in a specific piece of music, carers, teachers and companions are usually quick to respond, modifying behaviours and activities. For instance, while a baby may cry in response to an animated playsong when he is tired and not wanting to be stimulated, he may actually enjoy the same song when awake and content. Likewise, a preschooler may reject a specific song or activity by turning her attention elsewhere or uttering, "no, not that one," in one day, only to spend a considerable amount of time engaging with it on a different day (Ilari, 2017). Whereas such responses signal agency, they can also be interpreted as a form of self-preservation; as a way for children to indicate to their companions that engagement in a specific musical activity could potentially threaten their emotional well-being in a given moment.

Some of the assumptions that underlie much research on young children's musical engagement and its associations with well-being are also worthy of comment. In intervention studies where group differences favouring children who learned music are found, such differences are often interpreted in a positive light and associated with children's well-being (e.g., Costa-Giomi, 2014). For example, the development of non-musical skills (e.g., cognitive skills, executive functioning) through music is viewed as a long-term and indirect effect on children's well-being, following the logic of childhood as a period of "becoming." By contrast, studies on young children's musical agency tend to view well-being as occurring "in the moment." Whether well-being is viewed as an immediate, "in the moment effect" or as an indirect and long-term goal depends once again on conceptions of the child. These assumptions need to be made explicit, particularly as they have clear implications for early childhood education and care in many countries.

In recent years, there has been an ever-expanding academisation of early childhood education, with some music programmes becoming less play-based and more standards-based in many preschools and care centres across the globe (Christakis, 2017). In other words, music is becoming more about prescribed content and less about children's agency (for an example see Ilari, 2016). Agency is the component that Roberts places at the top of the pyramid, which is linked to Maslow's concept of self-actualisation (Maslow, 1943; Roberts, 2011, 2014). What I am suggesting here is that while musical experiences in the early years of life may afford children with ample opportunities to experience physical development as articulated in Roberts's model, the agentic and "in the moment" aspects also need nurturing. Furthermore, close attention should be paid to the limitations of musical

experiences in fostering each one of Roberts's components of well-being. For example, as they engage with music, young children experience a sense of belonging whilst developing social boundaries. This raises questions as to whether musical experiences can also serve to transform potential social divisions into new knowledge and connections (and not further separations), for the greater good.

In conclusion, I urge readers to consider the early years of life as a period of being (not only of becoming), particularly where music is concerned. Being and becoming are not opposite ends, but parts of a continuum (Ilari et al., 2017). As we have seen, music in the early years is about experimentation, communication and being with others. Young children absorb existing repertory, communicate with it and transform it; they also use music as a means to sing, play, move, shake, appreciate, reject, invent, extend, improvise and contest the world around them. In this sense, they are musical *bricoleurs*, who develop and construct their musical knowledge as they go about their daily lives. Undoubtedly, the joy and sense of accomplishment that originates from communicating, experimenting, creating, engaging with and transforming the real world also produces well-being.

Note

1 In our longitudinal study, we found that children improve their vocal improvisation skills between the ages of six and ten. Children were also more prone to invent songs when given some freedom to choose between different tasks.

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20

MUSIC, EMOTION AND LEARNING

Jennie Henley

It is often assumed that learning music brings emotional, cognitive and social benefits, in line with the long-held belief (critically discussed throughout this *Companion*) that music itself holds the key to these benefits. However, there has been and continues to be, disagreement about how this is achieved. For example, referring to Gomart and Hennion's earlier work, DeNora demonstrates that listening to music does not merely "affect" listeners, but that listeners are agents in their own emotional self-regulation (DeNora, 2003; Gomart & Hennion, 1999). This position rejects the notion that emotional enlightenment is a one-way transaction from the work of art to the perceiver, an idea that, as I will argue, underpinned music education movements that placed listening to the 'Great Works' at the core of the curriculum.

As Woody points out, problems in education related to assumptions of the emotional content of music are often due to the fact that "most scholarly consideration of music and emotion has been carried out by philosophers and aestheticians rather than empirical researchers" (Woody, 2002, p. 215). An example of this can be seen in the North American educational movement Music Education as Aesthetic Education (Reimer, 2002). The movement developed during the mid-twentieth century at a time when music educators had to justify music's inclusion in school curricula. There was a move toward underpinning education with values based on moral, social, physical and emotional development and an education philosophy placing music as an art form, a policy supposedly enabling children "to gain meanings available from culturally embedded expressive forms" (Reimer, 1991, p. 203). Reimer drew on the ideas of Dewey, Meyer and Langer in order to provide a unifying philosophy of music education that provided a means to establish a rationale for music as a school subject. The rationale placed the value of music as a school subject as lying in what all children can learn from listening to music in terms of their emotional and intellectual lives, rather than what the few who are able to can gain from performing music. During the 1970s, educational psychology was concerned with behaviours and affect; aesthetic behaviours and affective outcomes were linked to cognitive psychology, giving the subject of music the weight it needed to be justified and recognised as making a unique contribution to human development. Reimer's rationale for music as a school subject had its problems. His philosophy of music education was based on the education system in the US, where children learnt to play music in bands and choirs and drop-out rates were high and he sought to provide a rationale for the worth of music for *all* children through listening. This, however, did not translate well into the education system in the UK and reinforced rather than challenged the sense that music was an elitist subject (Walker, 2001). Alongside issues of value judgment, contrasting viewpoints on the contribution that music makes

to human development arising from the empirical research carried out within sociology (Kaplan, 1966; Mueller, 1958), ethnomusicology (Merriam, 1964) and anthropology (Brameld, 1956, 1971) posed challenges to a unifying aesthetic theory of music education. Music educators at the time felt that these viewpoints all pointed to outcomes *outside* music itself, shaping a field of learning *through* music. What music educators were actually concerned with was arguing for a position of music based on musical outcomes alone (McCarthy & Scott Goble, 2009).

This divergence in approach remains significant today. The difference between what is often described as "learning music" and "learning through music" lies in the aims and assumed outcomes of the learning activity. An activity that has musical aims and therefore assumed musical outcomes, in whatever form, might be considered as learning music. An activity that has extra-musical aims and is therefore seen to focus on outcomes other than musical development might be considered as learning through music. Often, educational activities that have the aim of developing extra-musical outcomes, such as social and emotional development, are described as learning through music. The separation of educational activity in this way is problematic. Within programmes considered to be learning through music there are still musical outcomes, often demonstrable and evidenced in the form of performances, recordings, compositions and song-writing etc. Differentiating between different types of music educational activity creates a hierarchy and devalues the musical development that takes place in learning other than what is considered to be music learning. Furthermore, when translated into educational practice by practitioners with limited understanding of pedagogical processes, the notion that emotional development occurs as a result of learning *through* music reinforces the idea that the emotional content of learning music lies in the music not in the interactions between people and music that constitute how music is learnt. In England, this is evidenced in the waves of advocacy for music education that flood social and popular media based on the power of the musical object, often accompanied by strong images and statements of what that musical object is and exacerbated by a national curriculum for music that has returned to the notion of studying the Western canon (DfE, 2013).

Just as it is acknowledged that music programmes with a focus on musical development give rise to personal, social and emotional development, as evidenced in English national policy documentation from outside the national curriculum (DfE, 2011), empirical research has demonstrated that within a music programme that focuses on personal, social and emotional development, musical development and socio-emotional development are symbiotic. Both musical and extra-musical outcomes arise from the same learning activities, the two different sets of outcomes are interdependent and the same development occurs whether it is described as a music programme or one for personal, social and emotional development (Henley, 2015a). The catalyst for this symbiotic musical and emotional development is not the curriculum, but the pedagogy used.

This chapter draws on the most recent research in a series of studies that explores learning processes that lead to musical, social and emotional development in order to challenge the assumption held by those who uncritically argue for the power of music on the basis that emotional development occurs as a result of the musical object rather than the learning activity. Also challenged is the notion that learning music and learning through music are separate activities – regardless of intention, since categorising learning by teacher intention alone fails to acknowledge learner agency and hidden and unexpected outcomes. The research will be introduced before questioning the assumptions of the emotional content of music that are implicit within other research studies in music education. Learning as a process is discussed through an introduction to the different categories of learning theory in order to examine how different forms of learning either acknowledge or neglect emotional development as part of the processes of learning. This includes a discussion of curriculum and pedagogy in order to untangle the difference between the content of learning and the form that learning takes and leads us to consider what it is that might make music unique as a subject in relation to emotional development. The discussions are explored in the practical context of the

pedagogy for a music programme for incarcerated people, the subject of a growing body of research about the potential for music programmes to foster personal, social and emotional development.

Researching Musical Learning and Emotional Development

The focus of the study presented in this chapter is on the pedagogy used within Good Vibrations programmes. Good Vibrations is a small UK charity that provides Javanese gamelan programmes for "hard to reach" populations, including those in prisons.[1] The programmes are usually short and intensive, culminating in an informal performance. The musical emphasis of a programme is on enabling individuals to engage in group music-making, to explore their own musicality and to develop their experience of creating music with others. However, the aims of Good Vibrations go further than encouraging musical engagement alone and include enabling diverse individuals to develop teamwork and communication skills, with a view to helping them develop musically, personally, socially and emotionally. Therefore the aims of a Good Vibrations programme embrace both musical and extra-musical outcomes with the recognition that they arise from the same pedagogical activities.

The first study in the sequence of research was carried out as part of my project investigating the ways that adults learn in ensemble contexts. The study explored the role of the social environment in musical learning, the role of performance in learning (as opposed to learning how to perform) and the ways that adults construct, develop and use musical identities in their musical learning (Henley, 2009). One finding revealed that adults actively switch the purpose of learning in order to overcome challenges and motivate themselves to continue in their learning. For example, if a person became frustrated because they could not play a particular passage, they would switch the purpose of learning from developing musicianship to something else such as to join a group and meet different people – i.e. from musical outcomes to extra-musical outcomes or learning music to learning through music. They were still developing musicianship and still meeting different people but because they had shifted the emphasis away from the source of frustration at that particular moment in time, they did not give up but continued in their learning and thus continued to develop their musicianship (Henley, 2016).

The project included a case study from a women's prison as a result of an autoethnographic strand of research (Henley, 2009). Autoethnography is described as "research, writing, stories and methods that connect the autobiographical and personal to the cultural, social and political. Autoethnographers use reflexivity to illustrate intersections between self and society, the particular and the general, the personal and the political . . . (so as to) help humanise emotionally sterile research processes" (Ellis & Adams, 2014, p. 255). The strand involved learning to play Javanese gamelan in order to have the experience of learning to play music within an ensemble. An opportunity to join a new Javanese gamelan arose, a different musical tradition from my own background and was challenging enough to experience the interactions between the individual and the social environment when learning to play within an ensemble as an adult beginner. I came into contact with Good Vibrations when the gamelan group was invited to play with a group of women in a local prison. On experiencing playing with the women both in rehearsal and performance and listening to their discussion of the challenges and what they had gained from the experience, the similarities between their learning processes and that of orchestras, string orchestras, concert bands and Javanese gamelans in the outside community became apparent. Permission and ethical approval was given by the prison psychologist to interview the women as part of my study.

The second Good Vibrations study followed my original project and constituted a secondary analysis of data collected by a research team of psychologists in order to analyse it from an educational perspective (Henley, Caulfield, Wilson & Wilkinson, 2012). Sociocultural learning theory was used as the theoretical basis for this and a model of Cultural Historical Activity Theory (CHAT) developed as part of my previous study was applied so as to understand the educational processes.

The third study involved exploring these learning processes more deeply and comprised a case study of a programme in a Young Offenders Institute (Henley, 2015a, 2016), again using CHAT to analyse the learning. Two key findings from these studies were:

- the relationship between the facilitator and the participants was fundamental in fostering the musical, personal and social development that occurred during the programmes and;
- the spaces between and within the musical activities were essential in participants' developing their communication and teamwork, while simultaneously fostering their progress in music-making (Henley, 2015b)

The implication of these findings is that it is the relationships within music-making rather than the music itself that enable the development of musical and emotional outcomes and that it is the way that the activities are taught (i.e. the pedagogy) that enable these relationships to develop. This suggests that research should focus on the interactions between the people in the learning activity in order to explore how musical and emotional development are fostered in learning, rather than focus on the relationship between music and emotion.

Shifting the View of Where Emotion Resides

Critiques of aesthetic education have questioned the universality of the emotional content of so-called Classical music by investigating the notion that "the socio-economic status of a subject . . . has been found to be significantly related to aesthetic development" (Giomo, 1993, p. 144). This is echoed by Letts, who points out the dangers of a universal stance for emotional development that depends on "a deep familiarity with the genre" (Letts, 2012, p. 649). DeNora criticises the use of the Classical canon and the focus on listening, using Bordieu's argument that "musical values were not 'pure' but were rather linked to the maintenance of social distinctions" (DeNora, 2003, p. 167). However, there is a difficulty in changing the educational structures when the majority of secondary music teachers come from a Classical musical background, having adopted not just the modes of making and listening to music that this heritage implies but also its aesthetic suppositions (Sloboda, 2001).

Elliott's critique centres on the implausibility of a philosophy of music education based on the idea of absolute music, saying that it "fails to provide a reasonable explanation of the nature and value of (i) music and (ii) music experience" (Elliott, 1991, p. 23). In developing his "Praxial philosophy of music education," Elliott emphasised the importance of the act of performing in developing musical understanding (Elliott, 1995). This philosophical position has taken hold in North America and beyond as a way to counter the emphasis on listening in music education. Community music scholars are beginning to use Elliot's philosophy to underpin and analyse programmes that are based on active music making (van der Merwe, 2017, for example) and the first part of the twenty-first century has seen a rise of educational movements influenced by Small that are moving away from listening to and performing music in isolation, to what he called "musicking" (Small, 1998). Despite these critiques, advances in neuroscience have enabled the aesthetic education movement to demonstrate its relevance in the twenty-first century by bringing the debate back to individual capabilities alone and neglecting the role that the social and cultural environment plays. To put it bluntly, scholars such as Reimer have drawn on scientific research to uncritically reassert the position that "music education is the education of feeling" (Reimer, 2004, p. 23).

Since Woody highlighted a lack of research a decade ago, there has been a boom in empirical studies exploring music and emotions (Woody, 2002). Research includes studies into the use of music to regulate moods; the impact of background music on emotional development; music for children with emotional and behavioural difficulties; and music and emotional and social development

for disadvantaged populations (Bloor, 2009; Cobbett, 2016; Devroop, 2012; Saarikallio & Erkkilä, 2007). However, much research in the field of music education is still based on assumptions of embedded emotional content in music. Mualem and Lavidor explore the interplay between music, language and emotions through music interventions (Mualem & Lavidor, 2015). Using a control group and an intervention group, they tested emotional responses to music at two points pre- and post-intervention. The intervention consisted of a programme in music appreciation that instructed the participants as to what they would expect to hear in music containing different emotions. The results showed that the group who had the music intervention demonstrated significant improvement in their emotional responses compared with the non-intervention group. Mualem and Lavidor then repeated the test on long-term music learners but found no improvement in emotional responses (Mualem & Lavidor, 2015, p. 424).

This research is problematic for two reasons. Firstly, the first study's intervention group took a series of classes that told the participants how to respond in the test. In these classes participants learnt to listen for what were deemed to be the emotional cues in different pieces of music. The test asked them to identify the emotions that were expressed in various musical extracts. The problem with this is that the intervention group were taught how to take the test, whereas the non-intervention group were not. Therefore what it proves is that someone can be taught to listen out for what are deemed to be emotional cues in music, but it does not measure emotional development. Secondly, the same test was used in the second study to try and measure the impact that prior learning had on emotional development. The problem with this is that the music student participants' prior learning may or may not have included learning how to identify emotional cues in recorded music. More importantly, the research was based on an assumption that the emotional content in music is universal, something that is contested by non-Western music aesthetics (Benamou, 2010; Leante, 2013) and by historians of music and emotions.

Similarly Direktorenko takes the stance that music automatically contains emotional content, but unlike Mualem and Lavidor she recognises the role of pedagogy in emotional development. Arguing that external manifestations are not always in line with internally felt emotion, her research explores different music learning activities that provide opportunities for emotional development. Although she does acknowledge that "emotional experiences are tightly linked with learners' activity" and that the teacher's role is important, she goes on to say that the activities "gave learners the opportunity to experience the emotions embodied in the music" (Direktorenko, 2015, p. 135). Campayo-Muñoz and Cabedo-Mas put forward an argument that teachers and parents are highly influential in the development of emotional skills and that those skills have a positive impact on health, well-being and performance (Campayo-Muñoz & Cabedo-Mas, 2016, 2017). Their systematic review of literature does reveal that the teacher engaging the child rather than the music as object is crucial in children's emotional development and there is a suggestion that pedagogy might play a role, but the descriptors that they use are still related to music and emotion and not learning.

Other research has found that the amount of structure within a music learning activity has an impact on the potential for social-emotional learning (Carlisle, 2013). Using Illeris's argument that the process of learning unites "a cognitive, an emotional and a social dimension into one whole," she hints that it is pedagogy that connects music and emotion (Carlisle, 2013, p. 224; Illeris, 2004, p. 227). Flores, van Niekerk and le Roux go one step further and use a branch of learning theory, the body of theory that describes learning processes and underpins pedagogy, to understand the ways in which emotional and social well-being are enhanced through music learning. They show how their music activities were planned using Gestalt theory, moving from teacher-led music-making to more participant interactive tasks that led to social cohesion, developed teamwork and led to musical independence (Flores, van Niekerk & le Roux, 2016). (Gestalt theory is based on the principle of human connections as a catalyst for growth and that contact with adults helps children self-regulate).

Although Flores et al. recognise that learning theory can provide a way to view and understand emotional and social development, much of the research in music education does not, focusing solely on the music itself and on its supposed emotional content. Letts suggests that there is a failure to openly acknowledge emotions in music education curricula, implying that practice reflects research in that it focuses solely on the music itself (Letts, 2012). However, Aubrey and Ward illustrate that within the English statutory curriculum framework for children from birth to the age of five (known as the Early Years Foundation Stage – EYFS), Personal, Social and Emotional Development is posited as one of three prime areas of learning alongside Communication and Language and Physical Development (Aubrey & Ward, 2013). All three of these areas are fundamental for learning to take place in every curriculum area, including Expressive Arts and Design and children cannot engage in the learning process without developing these prime areas (DfE, 2017). As such, the EYFS recognises that personal, social and emotional development is part of an active learning process, whatever the subject content. However, there is a disconnect between the EYFS and the subsequent school phases. As a child moves beyond the Early Years at the age of five, the centrality of personal, social and emotional development is lost and the curriculum focus changes from holistic development to individual subject content, becoming more subject focused as the child grows. Personal, social and emotional development is compartmentalised into the non-statutory subject of Personal, Social, Health and Economic (PSHE) Education, with subject content including sex education, drugs and health issues. In the music curriculum, subject content manifests as the Western canon.

Learning as a Process

Broadly divided into three categories, behaviourist, constructionist and sociocultural, learning theory draws on epistemological understandings of how knowledge is generated in order to articulate how learning occurs (Fautley, 2010). Based on changing observable sensory-motor behaviours, behaviourist approaches focus on a cycle of stimulus and response. A teacher will break down a complex activity into small stages with each stage needing mastering before moving to the next stage. Teaching that adopts a behaviourist approach emphasises teacher-led strategies and progression of learning is evidenced through the changing behaviours of the student. While the process of breaking down complex activities into manageable steps seems entirely appropriate for effective learning, the focus on teacher direction and the disregarding of the student's "mind" has led to widespread criticism of this approach. In learning that adopts a behaviourist approach, learning is uncritical and emotion is treated as something that is learned and evidenced through demonstrable behaviours. This approach was taken within Mualem and Lavidor's research, where the demonstrable behaviours in identifying emotional cues reflected the assumed universal emotional content of the music and there was little criticality or agency on the part of the learner to develop their own emotional understandings (Mualem & Lavidor, 2015). In short, in music education "mere sensory-motor co-ordination is not enough to produce a musical result." (Fautley, 2010, p. 45).

In contrast, constructivist approaches place the student as an "active agent" in learning. Burton outlines the way in which Piaget's Cognitive Development Theory underpins constructivist approaches that use stage theory. Piaget's theory describes a series of age-related developmental stages that the child passes through as they grow, moving from understanding the world through sensory-motor mechanisms and developing the abilities to interact with experience through symbolic, logic and deductive thinking (Burton, 2009). The problem with Piaget's theory is that each stage is progressive and developed in turn, but there is no fluidity implying that once a person has passed through a stage of learning they cannot return to it. Bruner proposed a theory in which the stages (enactive, iconic and symbolic) are drawn upon depending on the nature of the thinking required (Bruner, 1966). The role of the teacher is to "scaffold" learning so that the students can engage in

thinking that will build on what they already know so as to construct new understandings. Within constructivist approaches, cognitive dissonance is a mechanism for developing understanding and moving between stages of learning. Cognitive dissonance occurs when prior knowledge is disrupted and the mind becomes active in working through the disruption. The process of working through this disruption is where new understandings are developed. As well as the teacher needing to disrupt prior knowledge so as to provide an opportunity for the student to assimilate a new understanding, students will also adapt the task at hand in order to regulate what they do (Finney, 2009). If emotion is understood to be a cognitive activity then engaging the mind through the construction of one's own understanding of music will lead to emotional development. Although still based on the premise that emotion is embodied in music, this was the approach taken in Direktorenko's research where the learning process involved the children building their own emotional and musical understandings as a result of working through musical challenges (Direktorenko, 2015).

Sociocultural theories place constructivist approaches in the wider socio-cultural environment in recognition that "learning does not occur in a social vacuum" (Fenwick & Tennant, 2004, p. 55). The way individuals interact with the social environment in the construction of knowledge is fundamental in theoretical approaches developed and influenced by Vygotsky (1978). Various theories such as Cultural Historical Activity Theory; Communities of Practice; Situated Learning and Gestalt Theory all place the interactions between people rather than objects at the heart of learning (Corey, 2015; Engestrom, 2000; Lave & Wenger, 1991; Wenger, 1999). This encompasses group and peer learning as well as the way that a teacher uses his or her understanding of the social environment to plan learning and it leads to socio-emotional development. In conceptualising inclusive pedagogy, Florian encourages educators to think "about learning as a shared activity where a single lesson is a different experience for each participant" (Florian, 2015, p. 16). She warns against teaching approaches that solely respond to individualisation of learning through differentiated activities, but the teacher must draw on sociocultural learning theory for pedagogy to provide rich learning opportunities for all. Thus pedagogy or the techniques and strategies chosen by the teacher to break down, scaffold, disturb and rebuild knowledge, is dependent on the teacher's understanding of the way that learning occurs within a social context. What is important to note is that the content of learning could be the same, but it is the form of learning (pedagogy) as informed by learning theory that determines whether emotional development takes place. If a teacher uses behaviourist pedagogy, the learning may only lead to behavioural changes. If a teacher uses constructivist pedagogy, the learning may lead to emotional changes but not necessarily to socio-emotional development. If a teacher uses a sociocultural pedagogy, then learning will lead to socio-emotional development.

One common misunderstanding in music education is the difference between curriculum and pedagogy, which can lead to dire consequences (Baker, 2014). Whether learning takes place in a school, a community setting, a hospital or a prison, pedagogy and curriculum are the mechanisms that enable learning to take place. Drawing on Gage's work, Siraj-Blatchford explains pedagogy as something rooted in the teacher's understanding of children in general (their nomothetic knowledge) and their understanding of specific individuals (their idiographic knowledge) (Gage, 1985; Siraj-Blatchford, 2008). The interaction of these two types of understanding enables the teacher to tailor their teaching activities to the particular idiosyncrasies of the group of children that they are working with. Pedagogy is described as the creative realisation of the application of general understandings to the particular group of learners. Therefore pedagogy is "the full set of instructional techniques and strategies that enabled learning to take place" (Siraj-Blatchford, 2008, p. 7). However, viewing pedagogy as simply a set of instructional techniques and strategies is problematic.

Within music programmes and projects that sit outside of institutional education, there has been a rise of a "tool kit" approach. Organisations have developed their tool kit to describe what is unique about their particular approach. In recent years we have seen the introduction of informal learning into school curricula. Described as "a new classroom pedagogy," informal learning seeks

to open children's musical learning through connections with the children's own music rather than the music chosen by the teacher. The approach uses techniques and strategies taken from a small research study exploring the learning processes of successful session musicians and lays out the approach through a sequence of learning that moves from children's own choice of material (assumed to be pop) to the introduction of music considered to be more complex as chosen by the teacher (Classical) (Green, 2002, 2009). The approach is supported by a website of downloadable lesson plans and activities, providing the teacher with a "tool kit" of resources. Whilst there is nothing wrong with providing resources for practitioners, apart from polarising two genres of music, the tool kit becomes the curriculum and there is a danger of it being applied without an understanding of how an appropriate pedagogy is needed for the activities to foster learning.

As mentioned above, emotional development is part of an active learning process that combines cognitive, emotional and social dimensions of human activity (Illeris, 2004). The uniqueness of music learning lies in the socio-musical interactions between teacher-student and student-student that music-making brings. When taught well music is the only subject in the school where teachers and students work together. Teachers perform *with* students, they listen *with* students, they improvise *with* students, they compose *with* students, they engage in a creative process together and share pride and ownership in musical activities that they jointly contribute to. However, this is not always the case and it should not be assumed that music-making automatically leads to emotional development. To use Freire's critique of uncritical pedagogy or behaviourist approaches to learning, when music is seen as something that is done *to* or *for* students, rather than *with* students, as in sociocultural approaches, then the capacity for emotional development is diminished (Freire, 1970).

Pedagogy in Practice

This can all be put into context by analyzing how teachers work with students within the Good Vibrations Javanese gamelan programmes. Good Vibrations use the term facilitator rather than teacher as in this context the term teaching holds many negative connotations, but in effect they are teachers. The four interviewees in the study presented below all have varied backgrounds as musicians and educators. Two had worked for Good Vibrations since it began (Interviewees 1 and 2) and two had been working for Good Vibrations for 3 or 4 years (Interviewees 3 and 4), one had a management position (Interviewee 4). The two who had worked for Good Vibrations the longest were both Javanese gamelan players before working with the charity and the two who had worked the shortest amount of time were new to Javanese gamelan on joining the charity. One facilitator worked with Good Vibrations' Music Technology programme as well as the Javanese gamelan programme. All had experience of working in composition, whether in education or as a professional musician. Two had worked as class teachers, one primary and one secondary, one had a management role within a local authority music service and all but one were currently working in a variety of different contexts.

The wealth of knowledge bought into their Good Vibrations work was evident; interviewee statements agreed insofar that none saw a difference between their approaches to working in prisons and in any other context. Interviewee 1's comments are echoed by the others: "I don't really think that prisoners are anything other than human beings . . . It's about drawing stuff from whoever you are working with and I would do that in any teaching situation."

Each facilitator has a "framework and a selection of tools and exercises to pull on," or as Interviewee 1 said, "we have our rag bag of things to do." There is a clear distinction between the curriculum of the programme and the pedagogical approach that each facilitator uses. The freedom that the facilitator has within the programme enables them to respond to the diversity that they encounter, as Interviewee 1 explains:

> *I've said there's usually a composition, but if the group are not really responding to that, I don't do it. And we usually do a simple traditional piece. But even that, if they are not comfortable with that, there is no rule to say we must do that in a week.*
>
> (Interviewee 1)

So whereas each facilitator has their own curriculum, they are not bound to any particular activity and can adapt their pedagogy in order to respond to the diversity that each group presents:

> *You've got to use your sensitivity and intuition as to whether you plough on with something or you leave it where it is. Again, you've got the freedom to do that.*
>
> (Interviewee 1)

Each facilitator discussed how they notice how participants engage in the activities, that they constantly question themselves and each other about their working methods, that listening is a fundamental aspect of facilitation pedagogy and how they responded to criticism and often adjusted their language accordingly. Most of all, they all emphasised their deep concern for the experience of the individuals participating in the music-making. Interviewee 2 explained that he came to review his own practice after seeing a video of himself working. He critiqued types of music programmes that centre on the presentation skills of the facilitator and the tool kit of activities alone (doing music *to* the students), finding that he was "always looking at the participants and thinking, what do they get out of this, what are they left with after this, what is their personal development after this." He described what he saw as a "lack of humanity and an artificialness" in his work and instead began to develop his practice to ensure that he worked with participants by putting them at the centre of the music-making:

> *Actually getting to know them and their needs and their challenges and their boundaries and all of that is basic and is essential. You can't just march in and deliver.*
>
> (Interviewee 2)

Each facilitator does have their tool kit of activities (i.e. a curriculum), but what these interviewees explicitly or implicitly articulated was the need for an application of the curriculum through a pedagogy that is centreed on creating, holding and inviting people to inhabit spaces for conflict, safety and reflection within a community of musical practice.

Spaces for Conflict

Recognition of conflict was deemed to be important for a number of reasons. These included the acknowledgement that conflict is a natural part of group functioning, that conflict in the music-making leads to creative problem solving and that "certain social mechanisms that try to avoid conflict" don't necessarily help people to "move past their boundaries" (Interviewee 2). Furthermore, there was a recognition that conflict often leads to transformation. Interviewee 3 explained how transformation manifests in different ways, but that it "usually happens through [a participant] trying to be disruptive or not wanting to be there on the first day." Another example was given by Interviewee 2 as he recounted ways that a particularly disruptive participant dominated a group. This particular participant had a large amount of musical experience and attempted to enforce his ideas on the others in the group. The domineering behaviour was addressed by highlighting it through a conversation with the participant outside of the group situation first of all and then by ensuring that he had his voice heard, but also asking for the opinion of others so as to negotiate a group musical decision.

A common response to disruptive behaviour is to remove someone from the group. Conflict, whether social, emotional or musical, creates cognitive dissonance. If students are merely removed from an activity they are not able to engage in the process of working through this dissonance. In the example above, through working *with* the participant not only was the conflict resolved, but the participant became more able to collaborate musically and work through the cognitive dissonance generated by a group creative process. One fundamental aspect of musical development is the need to be able to take a risk and make a mistake, but fear of making mistakes can lead to numerous psychological problems. If mistakes are punished then the student will limit the risks that they take. Therefore the teacher has a role to create a safe space within which students can take risks and make mistakes without fear.

Safe Spaces

Creating safe spaces where students can take musical risks involves knowing when to intervene and when to let things run their course. Interviewee 3 described "that awkward moment when [participants] are feeling uncomfortable and out of their depth and just a few minutes and they will fall into their natural roles." This was experienced by Interviewee 4 early on in her role with Good Vibrations. She recounted working alongside another facilitator in an improvisation activity during which the music became very "chaotic." She described that her immediate reaction was to intervene at that point, but the lead facilitator did not do that. Instead he let the participants work through the chaos of the music together and as participants became aware of the awkwardness, they increased their musical co-operation and the musical conflict was allowed to resolve and transform. The length of time enabled the participants to move beyond the initial chaotic phase of music-making and begin to communicate with each other bringing a coherence to the music. Interviewee 4 acknowledged that having the courage to let the "cacophony" happen in the knowledge that it will transform is part of the expertise of the facilitator. This is related to working *with* students as opposed working *to* or *for* them, as Interviewee 2 says, "you don't just charge in and start composing their piece for them."

Safe spaces also provided a means to start the process of group composing. Interviewee 2 starts group composing by giving participants instruments and the space to explore their instrument. This is done whilst he is out of the way, "the whole dynamic in a room changes when the teacher sits down and says you guys go and get on with it." This is echoed by Interviewee 1, "I'm listening to what they are doing, certainly, but I'm not even standing near them . . . so they'll think that I'm not listening." Participants go to different corners of the room and work on a small group task, sometimes involving the individuals working things out on their own and then bringing it back to the small group. Once participants have had the space to generate and develop their ideas away from the whole group and the facilitator, the facilitator begins a process of bringing together a collaborative composition. This process highlights how activities are scaffolded, drawing on deep understandings of the sociocultural environment and the need to oscillate between individual and group activities. The participants' journey through a shared process helps them to develop a shared responsibility for the music-making. However it is important for participants to have space within creative activities to try things out individually and away from the spotlight. This enables people to take a musical risk in a safe way or as Interviewee 1 said, "give them space so if they are not feeling comfortable they are not doing it wrong."

Creating an environment built on trust is fundamental to enabling people to feel safe in taking musical, social and emotional risks. Interviewee 4 stated that Good Vibrations is "particularly effective when the group of people that we work with are not used to being treated in such a mature trusting way." This ranged from entrusting participants with creating their own music to putting them in a position of control. Interviewee 1 explained that teachers need to know that "you've got someone's confidence before you can [push them out of their comfort zone]." Interviewee 3 described

a process of transferal of power to the participants as a way to develop a sense of ownership of the socio-musical environment as well as giving them the agency to effect change within that environment. Having said that, it was clear that boundaries do need to be set so as to make the physical, musical and social spaces safe. Interviewee 1 explained how "giving people who are quiet the space to have a voice and talk and not be dominated by the other ones" is important. However, once participants developed a level of trust they were more able to be open and engage in critical reflection, a key pedagogical activity that enables musical and emotional development to take place as well as foster progression in the musical activity.

Spaces for Reflection

Interviewee 2 explained that "noticing when individuals need their voice to be heard, but also when individuals are not listening to others is key to the decisions you make in relation to group activities." Space for critical reflection is paramount in Good Vibrations' work and formal space for feedback and reflection is provided by daily feedback sessions. Formal reflection is also built into the facilitation process, as facilitators have a daily feedback session in the evening with someone outside the programme, as well as an end of programme debrief. In addition to this, reflection occurs as a constant formative self-assessment strategy, a key component of the Good Vibrations pedagogy.

Good Vibrations facilitators engage in reflective practice and this is mirrored in their way of working with participants. Facilitators take time to talk to each other at lunch times and in the evenings and there are daily debriefings with a person outside of the immediate programme. This enables facilitators to reflect on their work, resolve any conflict that has arisen between facilitators and adapt their pedagogy as necessary. Opportunities for spontaneous critical reflection are an essential part of helping participants to improve their musical work:

> *We do a lot of feedback circles, even when they are sat at their instruments, so we say what do you think of that, do you like that?*
>
> (Interviewee 3)

Again, outside of the formal end of day feedback sessions, the facilitator will take the opportunity to encourage participants to reflect on both an individual and group basis as and when they feel it is needed. Conversations are seen as important and the facilitator will give time for sporadic conversations as they evolve. A handheld digital recorder is used throughout the activities to record musical work, this is then used to stimulate discussion. The formative assessment that this enables is paramount to musical progress as participants are able to analyse their work at a macro level so as to go back into it and refine it at a micro level (Gooderson & Henley, 2016). However, successful formative assessment in this way relies on mature interpersonal relationships and the ability to be able to both give and receive criticism. As the participants develop emotionally over the course of an intensive programme, their ability to engage in formative assessment increases resulting in a progression in their musical work (Henley, 2017).

A Community of Practice

What emerges is a pedagogy in which critical reflection mediates both emotional and musical development and that builds a community of musical practice where participants and facilitator take on different roles throughout the learning process. It is recognised that conflict is natural in both human behaviour and the process of learning music as understood through sociocultural theory. Providing safe spaces for allowing this conflict to surface is what enables the facilitator to steer the group and the music through conflict resolution and ultimately transformation. What binds this together is a constant care for the experience of the participants and a desire to provide opportunities

for them to flourish as individuals and group members. This enables the facilitator to scaffold learning and utilise the sociocultural environment to enable individuals to develop as ensemble members. Musical and emotional development are the result of a teacher working *with* the students and are interdependent. Participants are therefore enabled to occupy the learning spaces on terms negotiated as a group and the sociocultural pedagogical decisions enable Good Vibrations facilitators to create an environment that is inherently musical and also humanising.

> *What I want people to do is step out of their normal behaviours and for the quiet ones to start to feel that they can contribute more and for the dominant ones to realise that actually what they get out of that situation where other people are contributing is way more than they would get if they were dominating. Because then you start to feel a human thing coming back at you.*
>
> (Interviewee 1)

I have previously argued that musical learning and social and emotional development arise from shared learning processes (Henley, 2015a). In this chapter I have challenged the idea that musical and emotional development can be separated as outcomes and proposed that what is considered learning music and learning through music are one and the same thing. I have also challenged the idea that the emotional content of music learning lies in the musical object, rather it lies in socio-musical relationships created by a pedagogy informed by sociocultural learning theory. The different types of emotional development as observed by the facilitators are wide ranging and nuanced. Within an education system with a national curriculum that emphasises the musical object by specifying that children should study "the Great Composers" and listen to music of the Western canon and where music educators in a variety of different school and community settings are not required to have any qualifications or training in education or pedagogy often leading to an uncritical replication of practices (whatever those practices are), the assumptions of the connections between music, emotions and learning still needs to be challenged.

What is interesting about Good Vibrations' work is that they use Javanese gamelan specifically because music can be made with very little technique and also that participants are unlikely to have come across it. Like Western music, it is bound in its own aesthetic and philosophical ideology, but using it in a cultural context that has a different philosophical heritage means that the "esthetic baggage" of the gamelan is left behind (Benamou, 2010). However, Good Vibrations also work with other instruments, including guitars, looping and DJ technologies and the facilitators were clear that the pedagogy they use is the same whatever instruments they are using. Other organisations that provide music programmes for prisons work with, for example, Classical music, pop music, choral music and song-writing and evaluation reports consistently suggest similar interdependent musical and emotional development (Cohen & Henley, 2017). Therefore to attribute emotional development as a result of a music education programme purely to the content of musical learning shows a failure to recognise that learning is an active process and learners are agents in their own learning.

Note

1 www.good-vibrations.org.uk.

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21

MUSIC, COGNITION AND WELL-BEING IN THE AGEING

Susan Hallam

Introduction

The number of people aged over 60 is increasing globally, from 9.2% of the total population in 1990 to 11.7% in 2013 and is expected to reach 21.1% by 2050. In addition, the percentage of people aged 80 years or over was 14% in 2013 and is projected to reach 19% in 2050, 392 million people (United Nations, 2013). This increase has already put pressure on health and caring services internationally and led to attempts to find ways to maintain the health and well-being of older people for as long as possible. Listening to, and active engagement with, music has been viewed as a possible means of achieving this.

Music plays an important role in the lives of most people including those in later life. In 2007 Laukka found that two-thirds of his sample of 280 seniors listened to music at least once a day. This level of engagement continued through the third (50–75) and fourth ages (75+) (Bailey, Nilsson & Cohen, 2002). Older people may engage with music through listening to it or through active engagement with making music. Most of the research has focused on active engagement with music, despite that the fact that there is evidence across all ages that music listening can have a key impact on our moods and emotions (Gabrielsson, 2016; Juslin, 2016).

This chapter considers music's powers relating to conceptions of well-being in older people with a particular focus on active engagement with music as that is where most of the research has been carried out. It will focus on: the purpose and effect of the acquisition of musical skills in older age and the impact on identity, self-belief and a sense of purpose; music's benefits in relation to cognitive abilities; how it may ameliorate the effects of dementia; and its social, emotional and health benefits.

Musical Activities and Conceptions of Well-being

Well-being has been conceptualised in a range of different ways. Some authors have emphasised the eudaimonic aspects (positive human functioning) and others the hedonic (feeling good) (see Heggli, Vuust & Kringelbach in this *Companion*). The emphasis given to each varies in different conceptualisations. One conception that may have particular relevance to the impact of music is that of Huppert and So (2013). They adopt an approach based on mirror images of the criteria for the most common types of mental ill health, anxiety and depression, which they conceptualise in terms of flourishing. Ten categories are set out related to flourishing: competence, emotional

stability, engagement, meaning, optimism, positive emotion, positive relationships, resilience, self-esteem and vitality. The research on listening to and actively making music has shown how music can contribute positively to meeting these criteria.

Music can be experienced in a range of diverse ways, which may be why it can have such a powerful impact on our well-being. Relatively few activities have such a holistic impact. We can experience music physiologically through changes in blood pressure, heart rate, respiration, muscular tension, movement, posture and stomach contractions (see Fancourt in this *Companion*). Many musical experiences involve movement beginning in infancy with the co-ordinated movements of mothers and other adults with babies and later with dance. Music affects our behaviour, acting as a stimulus to movement or relaxation. We can also respond to music aesthetically, in terms of its perceived beauty or ugliness. It can be a source of intellectual stimulation as we identify structures and forms, analyse it, learn about its history and forms across different cultures or learn to play an instrument or sing, compose, improvise or perform. Music can have a very powerful effect on our emotions, including, chills, crying, lump in the throat, shivering, goose bumps. Some people report "peak" emotional experiences, the most common being exhilaration, joy and ecstasy (Gabrielsson, 2016). Music can help people work through difficult emotions, although the effects may not always be positive. For instance, music with negative themes such as distress, suicide or death, can increase depressive symptoms and suicidal thoughts.

Two research projects in the UK have shown the benefits to older people of active engagement with music. The Music for Life project used the Basic Psychological Needs test and the CASP-12 measure of quality of life, which was designed specifically for use with older people (Deci & Ryan, 2000; Higgs, Hyde, Wiggins & Blane, 2003). Three underlying factors were revealed which underpinned the participants' well-being: sense of purpose and a positive outlook on life; self-perceptions of autonomy and control; and positive social relationships, competence and a sense of recognised accomplishment. Comparisons of those engaged in music-making with those participating in other leisure activities revealed statistically significant differences on all three factors, with the music groups having more positive responses. Comparisons of those in the third and fourth age in the music groups revealed no differences in relation to the factors relating to autonomy/control or social affirmation which might have been expected to deteriorate with age. However, there was a deterioration in relation to a sense of purpose. These findings suggested that engagement in musical activities supported sustained autonomy/control and social affirmation into the fourth age (over 75 years). The findings from the qualitative elements of the research also revealed the enormous pleasure that the participants gained from engagement with music and the sense of accomplishment that they achieved (Hallam, Creech, Varvarigou, McQueen & Gaunt, 2014). Another UK study identified six mechanisms through which musical activities enhanced well-being: subjective experiences of pleasure; enhanced social interactions; musically-nuanced engagement in day-to-day life; fulfillment of musical ambition; ability to make music and self-satisfaction through musical progress (Perkins & Williamon, 2014). Overall, these studies show that making music can promote well-being whether it is defined hedonically or eudaimonically and that the processes through which this occurs are multifaceted.

Musical Learning in Older Age

Historically, there was a view that older people could not learn new things. However, research that has demonstrated the plasticity of the brain over the life span has indicated that this is not the case (Münte, Altenmüller & Jäncke, 2002). There is positive evidence that musical learning can continue through the third and fourth ages (Creech, Hallam, McQueen & Varvarigou, 2014; Dabback & Smith, 2012; Gembris, 2008). While older people may suffer hearing loss and have reduced reaction times, levels of concentration and poorer motor co-ordination (Cohen, 2009; Gembris, 2008), these

challenges can be overcome through strategies of selection, optimisation and compensation. Indeed, some older learners believe that their best performances have been when they are between the ages of 60 and 69 (Gembris, 2008).

Older learners can have some advantages over those who are younger. A rock band project in Australia showed that the maturity of third age participants helped them to make progress as they were better able to work in collaboration while also taking account of differences in musical preferences, ability and personality within the group (O'Shea, 2012). However, directors of music programmes for older learners in the USA showed mixed responses when asked to compare them with younger people. Some found them more resistant to change and slower at grasping new ideas, whereas others perceived that they learned faster, were better able to play expressively and had a deeper understanding of the music (Cohen, 2009). These differences may depend on the nature of the specific musical activities and the pedagogical approaches adopted. What is clear is that musical competencies can be developed whatever the age of the learner. Progression and a sense of accomplishment when goals were attained are important in supporting motivation and commitment for older players, too (Hallam et al., 2012; Jutras, 2006; Taylor & Hallam, 2008; Varvarigou, Creech, Hallam & McQueen, 2012a).

Musical identity can be developed in older people even if they have not engaged with music-making in the past. This is reinforced by other participants, family and friends (Dabback & Smith, 2012). Past negative unmusical identities can be changed, leading to a sense of empowerment and life satisfaction (Dabback, 2008; Taylor & Hallam, 2008). New musical identities can be developed, including learning instruments that were not previously considered appropriate and lost possible musical selves can be redefined or rediscovered (Creech et al., 2014; Dabback, 2008; Laes, 2015). Musical self-concept is enhanced through being part of a musical community and through performance. Performances provide opportunities for positive feedback, although they can be anxiety-provoking for some. They provide opportunities for social affirmation and validation as a musician while also offering opportunities to provide pleasure and enjoyment to others (Creech et al., 2014).

The Benefits of Making Music on Cognition in Ageing

In addition to enhancing musical skills, actively engaging in music-making can enhance other competencies. Comparisons between adult musicians and non-musicians have shown that the former perform better on a wide range of auditory tasks and may have greater control of attention and concentration (Hanna-Pladdy & Gajewski, 2012; Parbery-Clark, Strait Anderson, Hittner & Kraus, 2011; Zendel & Alain, 2012). Rogenmoser and colleagues using MRI scanning showed that musicians had less reduction in BrainAGE than non-musicians, although it was amateur rather than professional musicians who had the least decline (Rogenmoser, Kernbach, Schlaug & Gaser, 2018).

Older adults (aged 60–85) receiving individualised piano lessons over a 6-month period showed significant improvement in attention, concentration and planning, compared with controls, although regular practice and tuition were needed to maintain the gains (Bugos et al., 2007). However, a more intensive training progam with only thirty hours of contact showed positive effects on verbal fluency and processing speed (Bugos & Kochar, 2017). When compared with average demographic data, those who are actively engaged in making music have enhanced cognitive and psychomotor performance (Moser, 2003). Also amateur participants in singing activities comment positively on the way that singing stimulates cognitive capacity including attention, concentration, memory and learning (Clift, Nicol, Raisbeck, Whitmore & Morrison, 2010. See also Thormählen in this *Companion*). Those participating in a range of musical activities also report that they provided stimulating cognitive challenges that contributed to feeling active and alert. (Hallam et al., 2012).

Older people can also engage productively in creative musical activities. Allison studied a group with an average age of 87 as they attended song-writing sessions and found increased animation and a sense of ownership amongst the participants (Allison, 2008). Vella-Burrows showed that with support, dementia sufferers could write and perform their own song-cycles, while Habron and colleagues found that composing contributed to a sense of well-being through participants having control over musical materials, opportunities for creativity and identity making, validation of life experience and social engagement with other participants and professional musicians (Habron, Butterly, Gordon & Roebuck, 2015; Vella-Burrows, 2012).

Music-making not only enables the learning and development of musical skills, it also supports the enhancement of aural skills and those relating to attention, concentration, memory and creativity.

Music and Dementia

Dementia represents the most extreme case of cognitive decline (see Hara & DeNora in this *Companion*). Music has been proposed as a low-cost, creative solution that may help in treating and managing the behaviour of dementia sufferers and in supporting the retrieval of long-term memories. Some research has explored whether music can protect against such cognitive decline. For instance, in Germany, a group with a median age of 71 engaged in an intervention that included music as part of a range of activities. The findings showed that those in the fourth age enhanced their speed of information processing while those in the third age reported an improvement in subjective memory decline (Tesky, Thiel, Banzer & Pantel, 2011). Several studies have shown that musical activities can have a positive impact on cognitive function (Innes, Selfe, Khalsa & Kandati, 2017; Tai, Wang & Yang, 2015). Engaging with music over longer periods of time may also slightly reduce the risk of dementia (Verghese et al., 2003).

For those with moderate or severe dementia, group musical activities have been used to facilitate reminiscence and engagement (see Pavlicevic, 2012). Such activities seem to have behavioural benefits (e.g. Skingley & Vella-Burrows, 2010). Singing, instrumental playing and movement to music have been associated with physical, social and emotional improvements. For example, short-term increases in positive mood, sociability and self-confidence have been reported (Lesta & Petocz, 2006; Svansdottir & Snaedal, 2006). However, generally no significant long-term effects have been found in relation to cognition, although there are some exceptions (Gomez Gallego & Gomez Garcia, 2017). Typically, musical activities reduce disturbances, aggressiveness and anxiety, although the positive outcomes are not maintained unless the activities continue (Svansdottir & Snaedal, 2006). A significant reduction in depression was found in nursing home residents who engaged with singing (Myskyja & Nord, 2008). The strongest effects were found for those who exhibited the highest levels of engagement. Overall, it seems that engagement with music can, in the short term, ameliorate some symptoms of dementia, particularly those related to emotional and social behaviour and enhance the quality of life. These conclusions are supported by meta-analyses and reviews of the literature which have variously shown positive effects on cognition in the short term and a positive impact on disruptive behaviour, mood, anxiety and agitation (e.g. Elliott & Gardner, 2016; Fusar-Poli et al., 2017; Scott & Kidd, 2016; Xu et al., 2017; Zhang et al., 2017).

Live concerts and one-to-one musical interactions can benefit those with mild levels of dementia, who show increased levels of co-operation, interaction and conversation, while those with more advanced forms exhibit decreased levels of agitation and anti-social behaviour (Cox, Nowak & Buettner, 2014; Shibazaki & Marshall, 2017). Peeters, Harbers and Neerincx (2016) designed a personal music assistant, the ePartner, which included annotated playlists, a music and picture album and a picture slide show. Use of the ePartner stimulated the telling of life stories related to the songs and evoked positive individual and group experiences. The close links between personal

identity, life events and music go some way to explaining why music is beneficial for dementia sufferers. The music invokes memories of key events in people's lives along with the emotions associated with those events. This leads to recollection of details of those events, while the emotional impact improves mood and behaviour (McDermott, Orrell & Ridder, 2014).

Music, Social Life and Sense of Purpose

Social networks support prolonged personal engagement and can have an impact on physiological and psychological health including decreasing the risk of dementia and increasing happiness (Smith & Christakis, 2008). Making music provides opportunities for considerable social interaction with consequent social benefits (Coffman, 2002; Creech, Hallam, McQueen & Varvarigou, 2014; Lehmberg & Fung, 2010). Social networks centered around music-making support group identity, collaborative learning, friendship, and provide social support and a strong feeling of belonging amongst group members.

Coffman surveyed 52 members of a wind band for senior citisens and found that social interaction, feeling enriched and experiencing a sense of accomplishment were attributed to active music-making (Coffman, 1999). Participants and facilitators across a range of different musical activities in the Music for Life project also reported a range of social benefits (structure, sense of community, socialising, teamwork) (Creech, Hallam, McQueen & Varvarigou, 2014).

Several studies have focused on choral singing. Langston and Barrett studied members of a community choir in Tasmania, the majority of whom were retired and found that the choir was a strong community resource, fostering trust, learning, interaction, participation and civic involvement. The choir members were united by a strong sense of fellowship that was generated through singing together. This was derived from feelings of trust, camaraderie, togetherness, friendship, warmth, support and awareness and care for the feelings and needs of other members (Langston, 2011; Langston & Barrett, 2008). Choir membership supported well-being, providing a sense of purpose, fulfillment, personal growth and a context for maintaining social relationships. Choir members described themselves as feeling like a family (Southcott, 2009; see also Davidson et al., 2014).

Attending rehearsals on a regular basis gives structure to people's lives. In the USA, Ernst and Emmons reported that a band for seniors could function as a replacement for the workplace as band members typically developed new friendships and a strong attachment to the group. Alongside the shared music-making, social ties were strengthened in practical ways such as scheduling "social" time around the rehearsals and outreach activities (Ernst & Emmons, 1992). Similarly, in the UK, the Music for Life project showed that music activities gave a purpose and structure to life after retirement, providing an activity to look forward to every week. Participants were motivated to make the effort to attend the groups, which were described as fun and enjoyable and places where participants felt a sense of community as well as personal fulfillment. Through participation in musical groups individuals were able to socialise with like-minded people, to work together as a team and to belong to a group that supported their musical aspirations (Hallam et al., 2012; Varvarigou et al., 2012a). Saarikallio also found that for older participants participating in music-making offered opportunities for alleviating loneliness and coping with the challenges of ageing, providing opportunities for progression and enjoyment and adding a depth of meaning to life (Saarikallio, 2011).

Musical activities also provide opportunities for intergenerational engagement within groups as most include members from the third and fourth ages. Some projects go beyond this and have wider age representation. For instance, Varvarigou and colleagues studied the responses of primary school children and older adults who had participated in a joint musical activity and concert. The older people reported that working with the children gave them energy and made them feel happy, while the children reported enjoyment. The activity was an opportunity for different generations to

socialise, show respect for each other and enjoy each other's company. The children, their teachers and the music leader all commented on the relationships and interpersonal interactions that were fostered (Varvarigou, Creech, Hallam & McQueen, 2012b).

Music, Emotion and Mental Health

Music has a very powerful effect on our emotions. This is underpinned by its stimulation of the autonomic nervous system. Bodily responses related to emotion include many chemical changes in the body (see Fancourt in this *Companion*). The enjoyment of music is, in part, because it leads to the production of dopamine, which plays a significant role in the neurobiology of rewards. The use of heroin, alcohol, cocaine and nicotine activates dopaminergic systems. Engaging with music stimulates this reward system (Keitz, Martin-Soelch & Leenders, 2003. See also Heggli, Vuust and Kringelbach's chapter in this volume).

Older people experience positive emotions and increased relaxation through listening to music (Gabrielsson, 2002). In a survey of 65–75-year-olds it was found that music was a frequent source of positive emotions and that participants used music for mood regulation, to nurture identity and agency and for enjoyment (Laukka, 2007). Similarly, Hays and Minichiello found that listening to and actively making music were associated with social and emotional well-being, offering a medium through which participants could express themselves and connect with others. Forssen, researching women aged 60–83, found that singing, playing instruments, listening to music and dancing provided a source of self-recognition and comfort, while Saarikallio in a study in Finland showed that those aged 65 and over used music for mood manipulation including promoting positive moods and providing solace and diversion (Forssen, 2007; Hays & Minichiello, 2005; Saarikallio, 2010).

The positive impact that music can have on emotions means that it may have a role to play in mental health. For instance, Hanser and Thompson explored whether listening to music could alleviate depression amongst older people. Thirty adults aged 61–86 who had been diagnosed with depression participated. After eight weeks significant improvements in depression, distress, self-esteem and mood were found. These improvements were still in evidence nine months after the original intervention (Hanser & Thompson, 1994). Actively making music has shown similar effects.

In a review of research concerned with the benefits of group singing amongst adults aged over 50, it was shown that singing together was linked with well-being. In addition to encouraging social participation, it reduced anxiety and depression (Clift et al., 2010). Zanini and Leao studied 26 members of a Brazilian community choir (average age 69) and showed that singing provided a means for self-expression and self-fulfillment and that participation in the choir fostered positive feelings about the future (Zanini & Leao, 2006). In the UK, 265 older participants (average age 67), randomly allocated to take part in a weekly "Silver Song Club" for 12 weeks showed significantly greater improvements in mental health. The effect was still evident 3 months later (Skingley & Bungay, 2010).

Similar effects have been found for those participating in instrumental ensembles. Elderly wind band members have described their music-making as essential to their quality of life, rating it in importance alongside relationships with family members and health (Coffman & Adamek, 2001). Similarly, community orchestra members from Germany, Austria and Switzerland (average age 71 years) reported that the orchestras were important sources of increased vitality, quality of life and happiness (Gembris, 2008). Creech and colleagues found that participants in the Music for Life project frequently referred to music participation as contributing to positive mental health. Individuals described how participation in music had helped them to cope effectively with stress, depression and bereavement. They attributed a sense of rejuvenation, a sense of spirituality and an emotional "lift" to making music (Creech, Hallam, McQueen & Varvarigou, 2014). Music can also play a role at the end of life (see Hara & DeNora in this *Companion*). When the value of music in hospice care

was investigated it was found that older people (mean age 74) who had received regular visits from a music therapist reported that it made a major contribution to meeting emotional, spiritual, social and physiological needs (Hilliard, 2004).

Listening to and actively making music contribute to positive mental health through their impact on the emotions. The level of concentration that making music requires may also offer respite from concerns about negative and stressful life events.

Physical Health

For many years, there has been recognition that mind-body interactions contribute to physical health (see Hara and DeNora in this volume). Recently, this relationship has been scrutinised scientifically. Psychological factors play a causal role in many illnesses and can play a major role in the speed and extent of recovery (Bekkouche, Holmes, Whittaker & Krantz, 2011). There is compelling evidence that positive emotions are associated with better health and health behaviours. Musical experiences can play a role in this as they lead to changes in hormonal systems. The nervous and endocrine systems often act together to regulate the physiological processes of the human body. Music can impact on these systems (Kreutz, Murcia & Bongard, 2012).

In the USA, Cohen and colleagues found that older adults with a mean age of 80 who participated in singing workshops and performances reported fewer health issues, fewer falls, fewer visits to the doctor and less use of medication. In the UK, Hillman surveyed 75 retired participants in a community singing project. The long-term benefits attributed to participation included no overall deterioration in physical health. A recent large-scale study in Finland showed that choir members reported higher physical quality of life when compared with matched controls (Cohen et al., 2007; Hillman, 2002; Johnson, Louhivuori & Siljander, 2017). The physical benefits of singing are one of the most common themes reported by community choir members (Skingley & Bungay, 2010).

Active music-making, in particular singing, seems to have a positive impact on the immune system and there is evidence that listening to music may have the same effect (Beck, Gottfried, Hall, Cisler & Bozeman, 2006; Kreutz, Bongard, Rohrmann, Hodapp & Grebe, 2004; see also Fancourt in this *Companion*). Some have suggested that singing might have an impact on lung functions, but the evidence is mixed (see Clift, 2012). There can also be beneficial impacts of music on those with speech impairments and in relation to mobility where external rhythmic cueing can support rehabilitation of motor movements (LaGasse & Thaut, 2012; Thaut, McIntosh, McIntosh & Hoemberg, 2001). Learning to play the piano or drums in a therapeutic setting can improve the quality, range and speed of movements (Schneider, Schonle, Altenmuller & Munte, 2007).

Music can reduce stress. Singing and other participatory musical activities, for instance dancing, can bring about changes in cortisol levels (measures of stress) (e.g. Murcia, Bongard & Kreutz, 2009. See also Fancourt's chapter in this volume). Music has also been used in clinical contexts to reduce stress levels during medical treatment (e.g. Le Roux, Bouic & Bester, 2007; Spintge, 2012). It has also been found that playing calming music to critically ill patients reduces the level of sedative drugs required (Conrad et al., 2007).

The type of music listened to may be important. Exposure to music that we dislike will not reduce stress and may increase it. Typically, the most positive benefits are found when individuals can select the music that they are to listen to themselves (Mitchell & MacDonald, 2006). Listening to Classical choral, meditative and folk music apparently leads to reduced cortisol levels (Fukui & Yamashita, 2003; Kreutz et al., 2004). Conversely, listening to techno music and upbeat pop and rock music tends to increase them (Brownley, McMurray & Hackney, 1995; Gerra et al., 1998). Listening to Penderecki's *Threnos*, partially composed in quarter-tones that highlight the dissonance of the music also led to reduced concentrations of serotonin, a chemical which normally contributes to feelings of well-being (Evers & Suhr, 2000). While some of these findings may relate to the

impact of calm quiet or loud fast music on our arousal levels, there is also the issue of familiarity with particular types of music. Typically, we respond positively to music with which we are familiar. While this is likely to be music within the tonal system of our culture, even within that tonal system we develop preferences for different genres and negative reactions to others. This would seem to be why music that has been self-selected produces the most positive effects.

Overall, music can have a positive impact on health in adults and the ageing population. This in part may be due to its impact on the emotions and anxiety although other possibilities cannot be ruled out.

Conclusions

Overall, there is compelling evidence that listening to and making music can support well-being in older age. Of course, these benefits are not restricted to older age and apply to babies, children, young people and adults more generally (Hallam, 2014; Parncutt, 2016). Listening to music has a powerful impact on emotions and individuals use it to change their moods. Active music-making can provide structure, purpose and meaning to life, opportunities for developing musical skills and a sense of accomplishment, social engagement and affirmation, while also supporting the maintenance of cognitive skills and providing a range of health benefits. For those with dementia it offers opportunities to retrieve memories and can ameliorate negative behaviours.

For these benefits to occur high quality musical activities are needed. The role of the facilitator is crucial in ensuring the widest possible benefits to older people. Good music leaders have been described by participants as: knowledgeable; patient but in charge; positive, enthusiastic and enhancing motivation; having a sense of humour; responding to needs and keeping a good pace and focus (Hallam, Creech, McQueen & Varvarigou, 2013). There are also a number of barriers to participation. Some older people have caring responsibilities, others may lack confidence or be afraid of socialising. The locations for the activities may not be easily accessible and there may be financial, travel or time of day constraints. Older people also need to be made aware of what is available in their areas (Hallam et al., 2012; Varvarigou et al., 2012a). Providers and others concerned with the well-being of older people need to be aware of these barriers and take practical steps to ensure that locations and timings of sessions are appropriate, that there are systems in place to provide information and encouragement for older people to engage, that financial barriers are removed and that those facilitating the musical activities have received training for working with older people. If older people are to enhance the quality of their lives through active engagement with music, policy makers need to address these issues.

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22

THE GOODNESS OF SMALL THINGS

Why We Need Longitudinal *and* Ethnographic Studies of Music in Dementia Care

Mariko Hara and Tia DeNora

Introduction

Although dementia (caring) is a long-term process that can extend to more than ten years, current literature on music in dementia care tends to focus on the immediate effects of music rather than on the ways that music offers more sustained benefits. Short-term effects and their reportage are useful when research funding is scarce (longitudinal research takes time and time is money). Equally, however, short-term effects of "music on the brain" (sic) are often rhetorically persuasive (witness the proliferation of YouTube videos, such as the infamous viral "Henry" video: www.youtube.com/watch?v=5FWn4JB2YLU) where music is depicted as having "immediate" effects of "quickening" and where the "evidence" of well-being – often behavioural manifestations that might just as easily be read as "being over-excited" – are taken as self-explanatory). The cultural reflex associated with the reception of "Henry," for example, is one that conceives of music as a kind of magic medium (and stays focused on the "now" of musical engagement rather than how musical engagement might nourish an individual's experience and interactions over the longer term). In celebrating "what" music can do without also investigating "how" music might actually work so as to "help" in myriad ways, we are failing to consider musical engagement as a social and ecological process, that is, as an activity that exceeds individual experience and that feeds into the construction of environments that promote and sustain well-being. In this chapter we focus on these social and ecological matters and we consider the many "smaller" and perhaps seemingly less dramatic ways in which music helps in situations of dementia.

One of those benefits is community support, i.e. the ways in which musical activity not only adds cultural "furnishing" to situations and social spaces, but also primes those spaces in ways that can promote "wellness" between people over longer periods of time through its knock-on effects (DeNora, 2013). Only longitudinal work can capture these effects since they take time to become embedded and develop within social settings. This chapter uses a case study to highlight the importance of longitudinal research, specifically longitudinal ethnographic research for capturing music's benefits and describes the ways in which music is a "permeable" resources, that not only "works" in a given "now" or moment but that is diffused over time within social space in ways that interact with other features of that space and thereby offer new resources and new opportunities

for being well. Permeable resources, in other words, spill out into a much wider range of times, spaces and situations and interact with features of the world around the patient/sufferer that are not necessarily musical per se. Because of this interaction music is also a sustainable resource – its benefits are embedded into a range of everyday practices and networks. This understanding of music's permeability and sustainability as a health resource is in turn linked to a different way of understanding what music does in relation to health/well-being and how it works. Music, then, is less of a health "technology" or "intervention" and more of a relational medium and an ecological material.

Using as a case in point a two-year ethnographic study of a weekly communal music activity run by the Alzheimer's Society in the UK (Hara, 2011a, 2011b, 2013), we describe how the benefits of music (and music-making) develop over time in relation to transformations within the group and in relation to the progression of dementia and how they played an important part in supporting relatives involved in end of life care. We describe how, by following the social networks that emerged from these musical events, it is possible to develop a much richer and broader understanding of how music "helps" in contexts where people are facing the problems in living associated with dementia. We use this case study to outline an ecological perspective for music as a permeable and sustainable health resource that is easily integrated into daily life with significant positive impact over the short and longer term.

Music in Dementia Care: From Temporal Stimulus to Permeable and Sustainable Resource

The interest in the use of music in dementia care comes from a number of disciplines including neuroscience, music therapy and more general (therapeutic) music activities for those with dementia. In the neuroscientific approach, the study of music's effects on the brain is a long-standing research area (Hodges, 2000). Discussions in this field have tended to focus on the "mechanics" of how music works on the brain, for instance, how music can be a stimulus for memories (Baird & Samson, 2009; Cuddy & Duffin, 2005), the relationship between music and language (Koger & Brotons, 2000; Ruiz & Montanés, 2005) and behavioural management (Choi, Lee, Cheong & Lee, 2009; Goodall & Etters, 2005; Raglio et al., 2008). In neuroscientific models, quantitative methods are used to "prove" the effectiveness of these "mechanics," most commonly illustrated in statistics from randomised controlled trials (e.g., Haas & Brandes, 2009; Miller et al., 2000). In music therapy in dementia care, music is often discussed as a possible medium to enhance verbal/non-verbal communication (Koger & Brotons, 2000) and, as in neuroscience, to access memories (Cuddy & Duffin, 2005; Ridder, 2003) or manage agitated behaviour (Raglio et al., 2008; Ridder, 2003; Vink, Bruinsma & Scholten, 2002). The social aspects of music in dementia care, whether or not the music-making in question is active, have also been discussed as a means of building interactive relationships (Simpson, 2000) or facilitating the relationship between carereceivers and caregivers (Clair, 2000, 2002). (For example, even if music activity consists of "passive" listening, music offers a new topic of conversation or a shared focal point.) In short, music therapy for individuals with dementia tends to focus on communication, memory, behavioural management and on facilitating interactive relationships with therapists and caregivers.

In both neuroscientific and music therapy models, music is often regarded as a temporal stimulus (or tool) for making specific changes. One of the reasons why this view is prevalent, especially in the use of music in dementia care, may come from both the temporal quality of music and short-term memory loss of people with dementia. In fact, many of the experiences are forgotten soon after the music stops (Sixsmith & Gibson, 2006) and higher levels of engagement shown in their music therapy sessions only last for approximately half an hour (Odell-Miller, 2002). This certainly affects caregivers' motivation negatively (Sweeting & Gilhooly, 1997). According to Götell who

explored the extended effects of participating in musical events among participants with dementia further through an ethnographic study, participants demonstrated enhanced attention span and full vitality directly after the events (Götell, 2003). Ridder, on the other hand, discussed the importance of indirect "side effects" of music therapy in "repair(ing) and strengthen(ing) the interaction between the person with dementia and the caregiver in order to influence the culture of care in the most positive way" (2017, p. 30). Recent music therapy research also emphasised the involvement at various levels of caregivers in sustaining the benefits of weekly music therapy sessions for people with dementia (Hsu et al., 2015; Ridder, 2017).

This work suggests that further investigation should focus on exploring these "extended (and side) effects" of music and investigate how they can be integrated in everyday lives of people affected by dementia (both people with dementia and their caregivers) in a sustainable manner. To do so, we need to challenge the dominant view of music as a temporal stimulus (or tool) to make specific changes. This challenge includes developing further ecological perspectives that can address how music's "benefits" transfer to different times and places in the everyday lives of people who are affected by dementia.

Ecological Perspectives on Music

Several studies, mainly led by community music therapists (Pavlicevic & Ansdell, 2004; Stige, Ansdell, Elefant & Pavlicevic, 2010), have touched on the ecological aspects of organised musical events by situating them in the broader ecologies of everyday life. Aasgaard for instance discussed how pleasurable moments of song activities in paediatric oncology settings can be carried over with their potential for "providing good memories and creating pleasurable expectations" (Aasgaard, 2002, p. 203). Thus, music activities add "colours" to participants' present lives by keeping their creativity or imagination alive in between the music activities (Aasgaard, 2002). Other studies have investigated the individual use of music in everyday life for the self-regulation of emotions and corporeal state (Batt-Rawden, 2007; Hara, 2007; Skånland, 2012) and as a "technology of self" (DeNora, 2000). Such investigation into the "lay craft" of everyday health musicking can bring new insights into the organised events (Batt-Rawden, 2007; Hara, 2007). These studies also highlighted the importance of understanding the rich variety of musicking in seemingly different arenas as part of a coherent ecology (Small, 1998; for further uses of Small's concept of "musicking" see Ilari in this *Companion*).

Music as ecological phenomenon rather than temporal stimulus can be usefully framed by the sociological concept of "affordance." DeNora has developed this concept emphasising the discursiveness of musical affordance and its dependency on the process of appropriation:

> Music's role as a resource for configuring emotional and embodied agency is not one that can be predetermined (because it is a resource that must be appropriated by music consumers). Music is not an objective "force" or a "stimulus," but it is real in its effects and its specific properties provide mechanisms for achieving those effects.
>
> (DeNora, 2000, p. 107)

Music is therefore a resource which – depending on its appropriation – may produce a sense of wellness. In what follows, we use Hara's study of music and dementia to illustrate the affordance/appropriation concept pair, combining this pair with the "musical event" scheme so as to examine music's affordances in different settings for people affected by dementia over time; we will see how music's benefits can be traced over three time phases: "before the event," "during the event" and "after the event" in order to examine what music can afford and how such musical affordance

can be integrated in a sustainable manner into the everyday lives of people affected by dementia (DeNora, 2013; DeNora & Ansdell, 2017).

The aim is to develop a methodology that is attentive to music's "small" ways of "getting into" action, experience and, importantly, interaction over time. This focus tilts more overtly "therapeutic" concerns – how to "administer" music, music as "intervention" – and instead seeks to trace through gentle and "slow" methods how music nourishes ecologies of care (DeNora, 2014; Pavlicevic & Ansdell 2010). The longitudinal focus is the only focus that can reveal these matters since following how music "takes root" and grows as a resource within specific settings cannot be explored in the short term. It is also the only method that can show us how all individuals within a setting tap into music and connect musical activities to other activities and other relationships and forms of meaning-making over time in ways that create pathways (Ansdell & DeNora, 2016) toward collective well-being in and across time/space. The focus, then, is not "what music does" but rather "what people do with music."

Longitudinal Ethnographic Study

Given the problems of using interviews with people affected by dementia, ethnographic studies have often been used to shed light on the experience of dementia and dementia care (Bassett & Graham, 2007; Hubbard, Downs & Tester, 2003; Kontos, 2004). Ethnographic studies have also been useful in highlighting the situated use of music in everyday life (DeNora, 2000, 2003; Frith, 1978, 1981; Martin, 2006; Willis, 1978). Hara's longitudinal ethnographic perspective enabled her to understand informants' experience of musicking in ways that went beyond or provided a different angle on, reports from interview respondents (Hara, 2013). Her aim was to document the musical/para-musical actions and experiences of people with dementia so as to evaluate medical models in which impairment is the usual concern (as opposed to people's emotions and activities and possible resources). She examined the community-based singing activity *Singing for the Brain* (SFTB) run by the *Alzheimer's Society* in Watertown, UK as a main research site.[1] The research of the longitudinal ethnographic study (two years) was based on the participant observation of weekly singing activity, interviews with participants and volunteer members and extended/continuous ethnographic study of music and the care world in Watertown.

Tuning into the Field as a Volunteer

Before starting the actual data collection, Hara worked as a weekly volunteer in the SFTB group for eight months, where she eventually collected data for the study. Participating in the actual music-making process in these ways was hardly a new approach; it had long been the standard approach within ethnomusicology where intersubjective involvement with music and people was the norm (Seeger, 2008; Titon, 2008). Hara worked as a volunteer member for eight months before the actual data collection. Joining in the "musical way of being-in the world" as Titon calls it, helped her to get to know people and to be known by them (Titon, 2008, p. 32). More specifically, it permitted mutual acquaintance in ways that did not require the use of verbal communication; this was often a difficult task considering the cognitive capacities of people with dementia as well as her initially limited capacities to understand their verbal expressions.

Participant Observation

After having spent eight months with SFTB solely as a volunteer, Hara began a more formal research phase of participant observation (though still within the volunteer role). Overall, twelve sessions were observed over six months.

Tuning in to the temporal act of musical moments: Hara used DeNora's methodological model, "the Musical Event" (DeNora, 2003). Every Tuesday during the term period, Hara arrived at the community centre before 1.30 p.m. where weekly SFTB sessions took place and started preparing the venue while chatting with volunteer members and welcoming participants with dementia and their caregivers, which constituted her participant observation "before the events." The music activity and with that the "during the events" observation started at 2.30 and continued for over an hour until the participants left the venue. The "in-between and after the events" observation was based on additional ethnographic study on music and care worlds outside of weekly SFTB sessions as well as interviews with participants.[2]

In parallel, Hara conducted semi-structured interviews with volunteers, with the facilitator and with two representatives of the Alzheimer's Society so as to explore the group from an organisational point of view. Hara then interviewed participants with dementia and also their caregivers. In all cases, the purpose of the interview was explained to the caregivers and carereceivers at the time of obtaining informed consent and the interviews were conducted in the presence of both caregiver and carereceiver. As Steeman, Godderis, Grypdonck, De Bal and De Casterlé (2007) have suggested, interviewing a person with dementia and his/her caregivers together provides a richer understanding of the social context and the person with dementia's lived experience because it "triangulates": it allows for a topic's exploration from different methodological angles. Hara also employed the caregivers' assistance in explaining and signing the consent form with the members who were in later stages of dementia. Though problems with obtaining "informed" consent from people living with dementia have been noted in the literature, none of the participants with dementia gave any indication that they were uncomfortable with Hara's presence or with her interviewing them and their caregivers (Dewing, 2002, p. 168). The notion of consent, in other words, might be broadened to allow for non-verbal and behavioural indicators (Hellström, Nolan, Nordenfelt & Lundh, 2007). In the singing sessions up to and beyond this point, Hara often chatted with participants about music and their daily lives. Therefore, although the interviews took place in different places such as their homes, these interviews became smooth "extensions" of these informal "chats" in the singing sessions rather than more restricted, formal interviews. This boundary blurring was useful as a way of eliciting rich information about everyday lived experience in relation to musicking. Key here was the focus on transitions from musical to para-musical events, settings and encounters.

We have taken some time to explain the methodological design so as to highlight the labour intensity of investigating music and dementia over the longer term and the need for more than one method if we are to explore how music "gets into" other, para-musical matters over time. We now turn to some of the things that this method can reveal by considering how music in action "helps" to promote wellness in situations of dementia.

Discursive Musical Affordances of Weekly Singing Activity: A Case Study

Patterned activity and the **creation of community:** A SFTB session followed a basic structure prepared in advance by Jessica (the facilitator). The format, which was common to all SFTB groups, started with warm-ups and the "Hello" song. Various songs and activities followed and they always ended with a calm song ("Shalom"). Although Shalom may be seen to be religiously significant, it was used here for its musical features and for the meaning of the word "peace," used as a salutation on meeting and parting. The members of this particular SFTB group (Watertown group) consisted on average of 30 regular participants at the time of the study; approximately 10 participants with dementia, their caregivers (10), 10 volunteers and the facilitator. Everyone sat in a circle and joined in the activities together except for Jessica who led the activity with her physical movement and a keyboard. The repertories used during the session were biographically relevant to the participants

(in their mid-70s to 80s) and to the outcome of continuous implicit or explicit negotiations among participants over time.

Memory: The use of familiar music for people with dementia has been discussed as having positive effects because it allows them to access their memories (Cuddy & Duffin, 2005; Ridder, 2003) and it works as a means for emotional/behavioural management (Sung & Chang, 2005). In contrast to anecdotes in the popular press, religious music (e.g., hymns) works no differently than any other form of familiar music that was at one time or another deeply linked to ritual forms of conduct – in all cases the music may stimulate recall and embodied conduct through muscle memories for example. There was, however, a need for further investigation of "how" and "why" these familiar, biographically relevant songs worked as useful means in dementia care. In SFTB sessions, the fact that songs could be remembered by the participants was more important than personal aesthetic preferences for the particular musical affordances. (Most of the time words and melodies were remembered at the same time but in some cases melodies seemed to be easily recalled, then words followed.)

Transforming Normative Roles and Relationships During the Events

Identity: Both Laura and Michael were very active amateur musicians in local choirs and local theatre, unfortunately however, both of them had to give up on these due to the progress of Laura's Alzheimer's disease. Michael talked about missing these musical involvements: "I had to give up a lot . . . being carer, you know." They became regular members of the group soon after they found out about its existence at a local carers' event. Although Laura's dementia was quite advanced at the time of the interview and she was not aware of her condition, she was fully aware of her ability to remember songs and obviously very excited about picking them up so easily. (Laura was able to recall songs she had once known quickly). Laura and Michael discussed how well she remembered songs:

> *Michael:* It is funny, she can remember the words of these songs you know.
> *Laura:* Every word I can remember, in the songs.

Such memory recall allowed her to regain her confidence as she often proudly expressed to others how beautifully she could sing. Rosie (a volunteer) also commented on this:

> She always wants to talk about [herself], how beautifully she has done it and everything. But that's her world, really. It's great for her [to come to the SFTB session], you see. She can do all that, whereas, ask her to cook lunch or go out to the shop, she can't do any of those things.

Empowerment: Rosie pointed out that Laura's ability to sing blossomed in SFTB sessions and that it empowered her and gave her pride as singing beautifully was now one of the few abilities Laura had left. Otherwise, her everyday life was filled with confusion and a lack of confidence due to her progressive cognitive impairment. The SFTB repertoire was an important element for musical affordances that gave members with dementia a joy and excitement of being able to achieve a sense of mastery by remembering and singing those songs. As soon as Jessica introduced the melodies of familiar songs from the past on the keyboard, other participants with dementia also became more alive and the words came out naturally. Cecily, a volunteer, also described this process and cited it as what she enjoyed in SFTB sessions:

> watching the people with dementia kind of come to life in front of you. The confusion seems to lift for a minute while they are singing.

Aesthetic priorities and capacities: Here we see how familiar songs helped participants with dementia to shift the role of a participant from someone who was "just" a dementia sufferer to someone who could remember songs and sing them beautifully. This had a positive impact on caregivers, as it elevated their estimations of their partners' present and future cognitive capacities, a point discussed by Gregory (2011, p. 170). In the case of Michael and Laura we saw how Michael was excited yet mystified by Laura's ability to remember all the songs as described above. This was all possible because of the use of the biographically relevant songs as they fostered empowerment and participants' joy of being able to remember and sing that would not otherwise have been achieved through unfamiliar music.

Rekindling of relationship: The biographically relevant songs also worked by nurturing the relationship between them as shared memories of songs were recalled when they sang them together. This was an important musical affordance to help participants to live "well" with dementia that the caregiver and carereceiver felt more relaxed and happier about each other's presence than they might feel when the everyday caring tension affected them. This point came clearly into focus during an interview with Hannah and Simon.

The interview with Hannah and Simon ended with singing more songs from SFTB as well as talking about music in everyday life:

> *Hannah:* [To Simon] You want to sing one more? From the book? Since we got the book here. [She looks through the songbook.] How about "I'll be your sweetheart" Simon? Shall we have that one to finish with? Because we all know that tune don't we. Do you remember it darling? We had it on Valentine's day. "I'll be your sweetheart." [Hannah starts singing, Mariko joins in, then Simon joins.]
> *Hannah:* Thank you, I should hold you to that. I don't need to hold you to that Simon, 59 years we have been married.
> [Hannah & Interviewer laughs]
> *Hannah:* Long time.
> *Interviewer:* Did he use this song when he proposed?
> *Hannah:* I think that is a Valentine's day song, you know. I think that's it. (laugh) I can't remember the actual proposal. I can't remember when we suddenly decided that actually we would get married.

As the conversation above developed further, they continued describing their life, starting from the time they first met during the war, their married life, their children and so on. Although neither Hannah nor Simon mentioned a specific association or memory related to "I'll be your sweetheart," one of the volunteers, Rosie, mentioned a touching moment involving this song during an earlier SFTB singing session:

> When Hannah and Simon first started to come, we sang that once and they both looked at one another and they both put their arms around another and Hannah started to cry . . . and it was so moving for them. Of course, you know, she doesn't get much back from Simon now. I mean, obviously they have loved one another a long time and she adores him still, but she doesn't get back the same as she now gives. [. . .] But really, that was very moving . . .

Simon was often tense and agitated, but when he joined in the singing during the familiar song exercises he became visibly calmer. When singing this particular, familiar song in SFTB sessions, both Simon and Hannah looked content and peaceful. "I'll Be Your Sweetheart" is a theme song of the 1945 musical when Simon and Hannah were in their late teens and they must have heard or

sung it with family or friends at that time. Singing this familiar song in SFTB sessions seems to have created an enjoyable moment that reminded them of their previous life and reconnected their relationship as a couple once again.

Such rekindling of relationship between caregiver and carereceiver was important to sustain the quality of caring in everyday life as suggested by Ridder (2017) who explains how repairing and strengthening the interactions between caregivers and care receivers are important side benefits of music therapy sessions.

Sustaining the pleasant moments in-between the events: Because the SFTB sessions were intermittent events (once a week during the school term), it was desirable to "sustain" the moments that the participants experienced positively in SFTB musical events so that they could be integrated into the everyday lives of the participants. In this way, the benefits of participating in SFTB events were not only effective during the events, but they also had a positive impact on participants' everyday lives when it came to maintaining quality of life.

For many members with dementia and their caregivers, SFTB was the only social occasion they attended as "social life disappears at this stage" as Hannah said and then continued, "we don't have a regular arrangement with anybody now the way we did. It filled the gap very, very well. It is good." Participating in SFTB, therefore, provided a framework for the life of participants with dementia and their caregivers outside of SFTB by providing opportunities for them to develop habits that hinged on the SFTB sessions. This in turn helped to sustain positive musical affordances from the SFTB sessions beyond the immediate aftermath of a session.

Hannah and Simon for instance developed their own pleasurable habits associated with participating in the SFTB sessions:

> *Hannah:* And we used to come up early, so that we could go and feed the ducks [. . .] and that was fun. We saved all our bread for them didn't we Simon?
> *Simon:* Yes . . .

Hara often saw Hannah and Simon walking along the river after the SFTB sessions as well. Their activities centred on the river seemed to be an important ritual in their life that had obviously developed around the weekly SFTB sessions.

There were numbers of similar examples of such individually developed habits that helped participants to sustain the moments they experienced in the SFTB sessions. For instance, Lisa and her mother, Caroline, always sang the songs they had sung during the SFTB session in the car on their way home. Peggy and Nichola often researched the background of the songs they had sung in the SFTB session online and talked about the lyrics and their memories of these songs. All these habits became meaningful rituals or events themselves as the sessions were repeated. These developments, together with the weekly SFTB session, were important as they provided regular and pleasant interruptions to their life with dementia which could otherwise be stressful and isolated.

Several caregivers and receivers described SFTB as something they could look forward to and that this in itself was a great improvement to their lives. A number of caregivers also explained that the carereceivers for whom they were responsible felt better after coming to the SFTB session for a day or even several days. Michael (Laura's carer/husband) for example described how Laura always felt better after singing in the session and that "[i]f Laura feels all right, I feel all right." Michael also looked forward to coming to the SFTB session because he knew he and Laura would have fun no matter how stressed they may have felt during the rest of the week. Participating in SFTB session once a week, then, also provides caregivers a respite by releasing the tension of everyday dementia caring.

In short, the positive changes that the musicking afforded within the SFTB sessions were developed further in participants' everyday lives not only through the use of music but also through

post- and pre-musically triggered emotions: looking forward to or reliving the weekly musicking which, as Aasgaard puts is, had the "ability of providing good memories and creating pleasurable expectations as an important spin-off from the actual song activities" (2002, p. 203). The moments of happiness they shared during the sessions or any elated feelings that emerged afterward might not last more than a few hours or a day or two. But by expecting the pleasurable event and possibly reinforcing the expectation with personally developed habits and arrangements devised by SFTB sessions, the moments were able to spill out into other parts of their lives and thus were prolonged. As a result, participants were better able to manage daily tension caused by the symptoms of dementia and dementia caring.

Singing Through the End of Life Care: "Shalom" and Permeable Borders

The session always closed with the song called "Shalom," the Hebrew word for peace, completeness and welfare. It is also used as a greeting meaning both "hello" and "goodbye." There are several versions of the "Shalom" song and some are hymns. The one sung in SFTB was translated into English from Hebrew:

> Shalom, my friends, shalom, my friends, shalom, shalom.
> Until we'll meet again my friends, shalom, shalom

In SFTB sessions, "Shalom" always came after the most exciting part of the session, the participation dances. "Shalom's" function was therefore to calm down energy levels and to give people the space required to have a few reflective moments. Below is a fieldnote from a session, which describes such a transition of energy level from a very lively rendition of Lambeth Walk with high spirits and a lot of laughter.[3]

> "All right, we will just finish with . . ." Jessica continues, but her voice vanishes into the general murmuring and laughter. She plays the first two notes gently on the keyboard, d and a, d and a to indicate the starting of the song. She pauses and asks the group, "Are we all OK? Now, a quiet song to finish with. We are singing "Shalom." Some of you might know this one" and she initiates singing (without any piano accompaniment),"Shalom my friends" and others follow her. Jessica now also sits down in a chair in the circle; no one is outside of the circle. The murmur and laughter are totally subdued at this point and the singing voices harmonise beautifully. Everyone here knows this song very well, no one needs to look at the lyrics or feel marginalised for not being able to participate, nor is anyone worried about marginalising anyone. With this song, everyone is on the same level.
>
> After the first verse ends, Jessica says gently "and quietly." This time, it is sung quietly and very beautifully.
>
> "And humming . . .," it is hummed quietly; I see people's peaceful faces. Some people are closing their eyes while humming. I catch Lisa having tears in her eyes. Karen notices it too and looks as if she is moved by it. This is a subtle "chain reaction" of emotion that singing "Shalom" affords. It is a song that everyone knows without having to think or worry about "singing" so attention can get drawn elsewhere to notice small thoughts, while still singing the song.
>
> The humming ends, followed by one second of complete silence. Jessica says "Thank you very much indeed" and everyone applauds; the murmuring starts again while volunteers slowly start to tidy away. A few minutes later I see Arnold standing near the entrance

> presumably waiting for his wife to finish chatting with someone. He is singing "Shalom" to himself.

"Shalom" tended to stay in participants' minds and ears after the session ended (many participants mentioned this in informal conversations). The melody and lyrics combined to allow a peaceful feeling to be sustained for some time. This musical entrainment was a key quality particularly for participants with dementia, who otherwise had difficulties sustaining their happy feelings due to their limited cognitive abilities. The sustained effect of "Shalom" also helped the participants to exit slowly from the musical event, sustaining the happy feelings while cooling down the excitement. This assisted them in their return to their everyday life, which was often filled with distress and bewilderment, in a calm and pleasant manner. This was observed in Arnold's behaviour; he was often agitated when first arriving at the SFTB session but became calmer after the session – and he sometimes continued singing "Shalom" while the room was being cleared out. Similar effects were discussed by participants with dementia and their caregivers. These effects could not necessarily be traced to a single song ("Shalom"). Rather they were the result of certain behaviours that were afforded by the totality of the session. However, the quality of "Shalom," a simple folk tune which was easy to sing and remember, seemed to have provided a particular strong affordance toward the calm feeling that was carried into participants' everyday life and became an important medium that connected two distinct entities: the SFTB session and the participants' everyday life.

This mediation seems to work primarily through the emergence of "Shalom" with its collective, symbolic meaning in interaction with participants' everyday life, especially their end of life and related caring. Many people said that "Shalom" was their favourite song or that the most moving moment for them occurred when it was sung, which also afforded a feeling of being together. This and probably the fact that "Shalom" was simple and easy to sing, have led it to be sung at several funerals of SFTB participants, including Jake's and Laura's. On both these occasions, Jessica led the singing. Through an ethnographic investigation of Jake's passing away, Hara tried to capture the emergence of the symbolic meaning of "Shalom" that developed as a resource to support people toward the end of their life and the attendant caring experience.

Jake and Marjorie were regular members of SFTB for almost two years. Jake had early stage dementia and it was not necessarily obvious. One day, Jake fell down and suffered a brain hemorrhage. This was a shock to all the participants as he had not shown any sign of dramatic deterioration in the regular SFTB sessions. Everyone knew that Jake's condition was serious; thus there were tensions and worries about Jake among the participants in the group. It was therefore natural that when Hara interviewed Deborah (a caregiver) soon after, they talked about Jake and Marjorie, in particular a recent episode that had occurred:

> [Marjorie] I happened to meet them [Marjorie and her son] in Lidl's in the shop. [. . .] She had just come from hospital, but he was drifting in and out of unconsciousness. But she said she thinks he was trying to sing "Shalom," it was awful. He was trying to sing, yes, she said "I was sure he was trying to sing Shalom, to say goodbye." Ohhh . . . I told Susan and both of us were nearly in tears when we sang Shalom on Tuesday.

Marjorie clearly believed that Jake was trying to say good-bye by singing "Shalom," (Hara was not able to validate that account independently). The narrative however, was shared among a few other participants at the next SFTB session and this had a further impact on the aesthetic experiences among the participants when they were singing "Shalom" that week. Jake passed away soon after and several members of SFTB went to Jake's funeral where "Shalom" was sung, although Monica, who at that time knew that Arnold would soon pass away, had to leave before it was sung as it was too emotional for her.

The passing away of people with dementia can be taken as a blessing (Sweeting & Gilhooly, 1997). In fact, several caregivers expressed that they felt relieved, rather than sad, at their partners' funerals to see them finally finding peace after they had suffered from dementia for a long time.

If we considered the death of a person with dementia a "positive" thing, singing "Shalom" at the funerals of participants with dementia was one of the ways to commemorate their passing or rather their "peaceful ending" among the SFTB community who had watched over their lives with dementia and shared joyful times with them through their collaborative musicking at the weekly SFTB sessions for a few years. What we clearly saw here was that what "Shalom" afforded was not bound exclusively to the musical events alone. Rather, the aesthetic experiences of "Shalom" permeated different areas. This resonated strongly with the concept of a grounded aesthetic, in which the meanings of aesthetic experiences were parts of the process of their being transported across time and space (Willis, 1989). In this case the meanings around "Shalom" were first developed through musicking in SFTB; later Deborah met Marjorie at the supermarket and talked about Jake's condition and his use of the song. Marjorie's narrative was later shared among the members and after Marjorie had been to a SFTB session to inform Jake's fellow participants of his death, several members of SFTB went to Jake's funeral at the funeral; Monica was unable to sing the song due to her own interpretation. In sum, the new and old meanings of "Shalom" were carried through different domains and developed further as the aesthetic experiences of the song permeated different boundaries. As a result, the meanings of "Shalom" grew beyond affording just a peaceful, reflective ending in the SFTB sessions. The "goodness" of the song which was nurtured in SFTB sessions was then actualised in different spaces (*outside* of SFTB), which in turn affected later aesthetic experiences of "Shalom" *inside* SFTB sessions.

Conclusions

The aim of this chapter was to demonstrate on the basis of a longitudinal ethnographic case study how a new ecological approach to the relationship between music, mind and well-being sheds a new light on the role of music in the everyday life of people who are affected by dementia. Within this approach music is seen as a permeable and sustainable source of health and well-being. Music is less a "magic bullet" and less a stimulus or gateway to the brain and more a shared, diffuse resource with which people can connect – to things, to emotions, to identities and emotional states and, perhaps most importantly, to each other. Music, in other words, is part of the furnishing of social settings and musical engagement is reconceptualised as an historical event – one with a before, during and, very importantly, an after that carries people, individually and collectively forward into yet more forms of connection and through that, forms of well-being. Music primes networks, it draws people together, it rearranges identities and relationships and it resides within settings where it can be variously tapped or appropriated for these purposes.

This appropriation involves highly active and highly crafted forms of engagement by all involved and for that reason, methodologically, it is important to follow the actors gently as they conduct these forms of engagement. Accordingly, we have described a number of discursive musical affordances brought by SFTB weekly singing activities that gave positive impacts on the participants with dementia and their caregivers. First, observation during the musical events combined with interviews with participants with dementia, their caregivers and volunteer members who knew the transformation of participants' everyday life revealed how musicking helped shifting normative roles and relationships. For instance, singing biographically relevant songs together in the group allowed participants with dementia to shift their roles from just being a person with dementia to a person who can remember and sing those songs with joy and excitement. The SFTB activities also helped nurturing the relationships between caregivers and care receivers as they recalled their shared

memories of songs from their past or/and by reminding caregivers their life before the onset of dementia. Musicking therefore helped to displace symptoms of dementia, albeit temporarily, the sense of loss experienced by caregivers and friends was overtaken and the normative roles and relationships around dementia were transformed.

All these musical affordances during the SFTB musical events were seemingly temporary but sustained into their everyday life through additional habits that were developed associated with the weekly events. The examples we noted were feeding ducks while walking along the river, singing the songs in the car on their way home and searching for the background of the songs sung and talking about the associated memories at home. Caregivers' involvements in the actual sessions were therefore essential in terms of developing these habits around SFTB sessions. These habits developed in-between weekly SFTB sessions and pleasurable expectations for participating in the SFTB sessions not only prolonged musical affordances during the event but also helped extending the framework into their everyday life both emotionally and pragmatically.

We have also demonstrated how musical affordance of a particular song, "Shalom" permeated into the participants' lives more broadly. The song was sung in different contexts in and out of SFTB weekly events even by participants who had left the group due to the progress of dementia. This helped symbolic and collective meaning to be developed in relation to participants' everyday life and eventually supported their end of life caring and bereavement processes.

All these musical affordances during, in-between and after the musical events were therefore discursive but developed expansively in the longer-term, while interacting with participants' everyday practices to be integrated and adapted into their everyday life. The case study also showed how musicking that took place in different areas (e.g., SFTB sessions, an individual car, individual home, funerals) became part of a coherent ecology, where music acted as a permeable and sustainable health resources to live "well" with dementia. Such "goodness" of music was nurtured and relationally established among participants (DeNora, 2010). All these "goodnesses" of music were small things, hence difficult to be perceived unless investigated with ecological perspectives in a longterm study as demonstrated here. Nevertheless, music fostered various connections across a number of temporal and spatial boundaries as a malleable and relational medium and helped participants with dementia and their caregivers to maintain their quality of life as the changes occurred in their lives at a variety of times and locations.

Notes

1 The names of locations and individuals have been changed to protect their privacy.
2 As I observed weekly musical events over the period of six months rather than just a single event, I called them "in-between and after the events."
3 A song from the musical "Me and my girl" (1937), whose title comes from a local street, Lambeth Walk in London. This song has become a famous song/dance since World War II in the UK.

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