Music and Empathy

Edited by
Elaine King and Caroline Waddington

First published 2017

ISBN: 978-1-472-44580-3 (hbk)
ISBN: 978-1-315-59658-7 (ebk)

Chapter 5

Audience responses in the light of perception–action theories of empathy

Clemens Wöllner

(CC BY-NC-ND 4.0)

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

5 Audience responses in the light of perception–action theories of empathy

Clemens Wöllner

When attending a musical performance, audience members may feel closely related to the musicians and even collectively related to each other. They may also imagine profound connections to the composer. Some theorists argue that musicians should feel what the composer may have felt, and transmit these feelings to the audience. In the third part of his treatise on the *True art of playing keyboard instruments*, C. P. E. Bach (1753) discusses sympathy in musical performance:

> A musician cannot move others if he is not moved himself; therefore he necessarily needs to be able to induce in himself all emotions which he wants to arouse in his audience; he conveys his feelings to them, and thus moves them effectively to experience co-sensations [‘Mit-Empfindung’] (p. 122).[1]

As pointed out in this well-known statement, musical performers should re-experience the composer’s passions when he/she was writing the music. According to Bach, improvisations affect the audience in an even stronger way, since emotions can be transmitted more directly. In doing so, musicians arouse a range of various affects in a ‘continuously changing’ manner (p. 122). Veridical experiences of these emotions, in contrast to Bach’s ideas, are an almost impossible goal for musicians to achieve, since they would need to feel the range of affects themselves while at the same time having to concentrate on the more physical and structural components of performing. Therefore, one could argue that musicians act *as if* they are experiencing certain emotions, and audience members are moved in ways similar to their emotional involvement when watching actors in a theatre play. Bach further states that in addition to the sound of the music, expressive gestures are useful for conveying a musician’s intentions and emotions. The multimodal coupling of body movements and sound is indeed at the core of many present theories of music’s emotional impact.

From an audience’s perspective, the communicative transmission and reception of emotions has often been equated with musical empathy. Stephen Davies (2011), for example, argues that listeners’ empathic responses to music are forms of ‘attentional emotional contagion’ (p. 144), which are based on mirroring processes: ‘sad music tends to make (some) listeners feel sad’ (p. 135). This idea seems somewhat contradictory, given that contagion is usually seen as

an automatic, unmediated process, while directing one's attention requires some deliberate, conscious processing (see also Miu & Vuoskoski, this volume). In this regard, Jerrold Levinson (2011) postulates that empathic experiences of musical emotions may lead to forms of 'imagined emotions' which are related to the ones in the experienced 'music's persona' (p. 327). While the potential imaginative nature of some emotions cannot be discussed here, Levinson's concept goes beyond the mere contagiousness in empathic responses to music. By ascribing a 'persona' to music, listeners may rather consciously attempt to take the perspective of this imagined subject – whatever the subject in music is supposed to be.

In this chapter, I will discuss how individual listeners grasp the musical performer's expressive intentions, what role bodily response mechanisms play in these processes, and how empathy may enable and modulate the understanding of what is conveyed in a performance. In particular, I will underline the significance of cognitive facets in the appreciation of music, which are, in turn, regarded as a veridical component of empathic responses that are not limited to emotional contagion. A new model of musical empathic interactions is proposed with perception–action coupling – that is, the idea that perception and action processes are fundamentally interconnected – at its heart. Since there are relatively few existing empirical studies about audience empathy, this chapter will take as a starting point consideration of components of empathy through discussion of original theories and research concepts that underlie empathic interactions in music. It will go on to review perception–action models of empathy prior to the proposal and discussion of a new model in the light of existing empirical findings. This critical and empirical review will inform an understanding of the ways in which audiences interact with music and performers. For the purposes of this chapter, audiences will be regarded in the broadest sense within the Western tradition, referring to one or more listeners in various settings engaging with live or recorded performances, thus accessing sound and/or visual stimuli depending on the context. For example, audiences may include individuals undertaking solitary listening to recorded music, shared listening and/or viewing of recorded performances with friends, or watching live performances in concerts or public venues. Audience members may include individuals with or without specialist training or expertise in music.

Components of empathy

In accordance with the ideas of Davies (2011) and Levinson (2011) as outlined above, most psychological accounts of empathy posit both automatic components of empathy, comprising contagion and mirroring, as well as more conscious components such as taking the perspective of someone else (Bischof-Köhler, 2012; Walter, 2012). In addition to the ability of feeling spontaneously with another individual, there are thus conscious and deliberate facets of empathy. These include trying to understand others by imagining their situation and state of mind, constructing an internal model of their reasoning, and evaluating the various factors that may influence their current behaviour or affect display. A positive

consequence of the comprehensive concept of empathy is the possibility for individuals to deliberately try to understand others better and therefore even learn to be more empathic. Music in particular may train listeners 'in social attuning and empathic relationships' (Leman, 2007, p. 126). Contagion, on the other hand, is supposedly more strongly related to personality characteristics that are less susceptible for deliberate changes (for further discussion, see Walter, 2012). Definitions of empathy should thus not be reduced to emotional contagion and mirroring, they should rather integrate the various subcomponents of empathy, including cognitive facets (cf. Bischof-Köhler, 2012; Coplan, 2011). At the same time, definitions need to be adequately specific in order to leave the somewhat slippery terrain of a concept with a rather long history in philosophy and psychology. Only with clear definitions of the subcomponents of empathy, valid hypotheses can be formulated and results be compared across different studies.

In 1980, Mark Davis developed the Interpersonal Reactivity Index (IRI), one of the empathy inventories most widely employed in general psychology and many music-related studies. The first subscale 'Perspective taking' assesses the degree to which individuals 'spontaneously adopt the psychological point of view of others' (Davis, 1983, p. 113). The 'Fantasy' subscale measures the personal transposing into fictitious characters such as those in films or books, and to some degree appears to be related to Levinson's (2011) imagined emotions. The two other subscales, 'Empathic concern' and 'Personal distress' assess emotional components when feeling or interacting with others. In sum, Davis (1983) laid stress on a multifaceted nature of empathy that included both the cognitive component of perspective-taking as well as emotional components. These facets of empathy have ever since been debated and refined in numerous studies across various fields of research (see, for example, Coplan & Goldie, 2011). As a side effect of the definition debates and refinements of components in past decades, researchers may have concentrated less on explaining the underlying psychological processes and behavioural consequences. Early approaches and current theories provide such an explanation, by grounding empathy in bodily response circuits. In the next sections, I will describe early accounts of empathy that influenced more recent theories, albeit some of the original concepts seem not always adequately rendered in some papers (see also Laurence, this volume, for further discussion of early conceptualisations of empathy).

Perception–action models of empathy

The introduction of the concept of empathy, a neologism based on a translation of the term '*Einfühlung*' (feeling-into), dates back to the second half of the nineteenth century. This period was characterised by the so-called psychological turn in aesthetics and the history of arts (cf. Büttner, 2003), in addition to the development of empirical methods in philosophy and early psychological research. Friedrich Theodor Vischer emphasised the importance of the perceiving subject over the discussion of normative qualities of art works that, up to then, rested at the core of academic aesthetics. According to Vischer, individuals attribute psychological

qualities to the objects they perceive, which lead to impressions of inner co-experiences. His son, Robert Vischer, developed the theory of an inner 'Me' in his dissertation *On optical feeling of form* (1872). The Me transports itself into an object and empathises with it – a process he termed '*Einfühlung*'. Influenced by Wilhelm Wundt, Vischer argued that the direct sensory and motor impulses evoked by perceptions may in turn cause positive or negative reactions in the observer. It is remarkable that Vischer employed a physiological–psychological evaluation circuit, thus highlighting bodily components in the perception of art, which is also a key principle of feeling-into.

As a psychological explanation for the appreciation of visual art and architecture, the concept of feeling-into inspired many theorists and artists of that epoch, especially those affiliated with expressionism (Wölfflin, 1886; see also Mallgrave & Ikonomou, 1994). Some art historians, on the other hand, criticised the shortcomings of the new psychological explanations, since they would not sufficiently account for the historical context in which art was created and perceived (see Büttner, 2003). Philosophers, including Edmund Husserl (1900/1901) and Edith Stein (1917), employed and developed further the concept of feeling-into, which soon became a key concept in philosophical thinking of that time. It should not be ignored that philosophers of the centuries before had explored facets of empathic behaviour in humans by the related term 'sympathy'. For instance, David Hume (1793), in his *Treatise of human nature*, describes sympathy between people as a type of communication of emotions. The ability to perceive these emotions influences aesthetic responses and ethical behaviour (cf. Coplan & Goldie, 2011).

For current definitions of empathy, however, the work of Theodor Lipps, a philosopher and (theoretical) psychologist around the beginning of the last century, was crucial. His ideas are often presented in a very condensed form and therefore merit detailed attention. Lipps is attributed to first describing the phenomenon of empathy in a systematic way (1903). His attempts to explain the underlying processes show striking parallels to modern theories of empathy (for example, Preston & de Waal, 2002, see below). In short, he proposed that observing someone else results in an inner strive or urge to move, which is particularly pertinent when perceiving affect displays of other people. As a philosopher specialising in aesthetics, Lipps was also influenced by the discoveries made in the first experimental studies of perception carried out by Wundt and Hermann von Helmholtz. Although not employing experimental approaches himself, he attempted to systematise human interactions and emotional responses on the basis of observable perceptual processes.

In the early monograph *Foundations of psychology* ('Grundtatsachen des Seelenlebens', 1883), he laid the foundation for the concept of inner co-sensations when interacting with others. The closer we feel to others, the more 'we mirror and re-experience their life in ours, the more we must feel with and for them…' (p. 687). Understanding other people, according to this view, is deeply grounded in realising the inner sensations that are evoked by perceiving others, and by projecting some of one's own feelings onto other people. Twenty years later, in *Foundations of aesthetics* ('Grundlegung der Ästhetik', 1903) he formulates

further that the other is an imagined and 'modified own Me' (p. 106), perceived by visual and auditory gestures and facial expressions. Although this radical approach may resonate with later theories of symbolic interactionism (Mead, 1934) and constructionism, it is the underlying process that is of particular interest here. Lipps suggests that nearly all utterances of life bear some expressive components, either as direct affective utterances or more indirectly in the way people move when being in different moods. In this regard, auditory affective sounds ('Affektlaute', Lipps, 1903, p. 106) may also evoke a feeling with others:

> When I hear a sound that is similar to the one I use for expressing this affect myself, so I find myself – not connected, but directly in this affect. … I do not merely grasp the concept that the affect has caused the sound, but I *experience* the affect. I co-perform it internally … I am inclined to jubilate with the jubilating person. We will name this concept … feeling-into ['*Einfühlung*'].
>
> (Lipps, 1903, pp. 106–107)

According to Lipps, 'feeling-into' someone else is a direct process that is based both on the close perception of other people as well as on own experiences with certain affect displays. People are only able to co-perform affective behaviours internally if this behaviour is grounded in their own nature. The joy of co-performing, without being distracted by any other thoughts or interests, is called 'positive feeling-into' (p. 110), which for Lipps is an explanation for someone's enjoyment of watching other people move. Negative feeling-into may arise when observing, for example, haughty affect displays that resonate with the observer but evoke unpleasant feelings. The positive process of feeling-into, leading to the wish of internally co-performing the movements, is seen as the 'basis for *aesthetic understanding*' (p. 120) of artistic movements such as those of an acrobat dancing on a rope.

Lipps argues that people strive for a 'kinaesthetic image of the movement' (p. 120) that matches the visually perceived optical image. While this kinaesthetic image is based on 'certain processes in our muscles and fibres' (p. 114), Lipps emphasises that 'aesthetic feeling-into' is an inner process that should neither be confounded with conscious acts of imitation nor with direct bodily sensations. Although he repeatedly refers to the resonance in the observer's body, his theory can thus not fully explain the interactions between the physiological and psychological processes of feeling-into. When seeing an acrobat, people do not directly experience any bodily pressures or other physiological reactions but rather feel the urge for 'inner activities' (p. 130). In other words, people do not merely strive for own peripheral sensations but attempt to instinctively grasp another person's state of mind:

> The actual content of my *aesthetic* feeling-into is the entire inner state or manner of the inner behaviour, from which emerge the individual acts of will and action. Or, in short: it is the *personality* that I experience sympathetically in the perceived.
>
> (Lipps, 1903, p. 132)

In this regard, Lipps employs the terms identification and sympathy to illustrate facets of positive 'feeling-into'. These processes are described as instinctive mechanisms that allow people to co-experience the 'inner behaviour' (p. 134) of others. It should be noted that researchers did not follow Lipps in using empathy and sympathy in almost synonymic ways. Empathy is seen as a more comprehensive concept that does not only encompass shared feelings with others (as for sympathy), but also includes taking the perspective of others (see, for example, Coplan, 2011). Lipps noted that familiarity and experiences with a range of different emotions, the corresponding affect displays and emotional movements shape the way people can feel into others. The experience of motion-like qualities is not limited to bodily movements of other people, since even optical 'shapes afford movement *possibilities*' (p. 144). In accordance with earlier ideas formulated by Vischer (1872), Lipps (1903) thus presents an explanation for the aesthetic pleasure that these shapes may offer in a different domain of art.

Taken together, Lipps proposed a theory of inner co-experiences with affect displays of other people that is based on bodily resonance. While the underlying mechanisms are not described in detail and the recurrence to philosophical terms such as 'will' or 'urge' may not offer sufficient psychological explanations, he provided the ground for further efforts to elucidate human interactions and empathic responses. Lipps did not explicitly apply his concept to the experience of musical performances, which is surprising given the high frequency of musical examples he employed in his various other writings, which directly address musical themes, such as harmony (Lipps, 1885). Although he introduces the concept of feeling-into with examples of affective sounds (see above), Lipps primarily refers to visual perception in revisions of his concept. Recently, researchers may have slightly misinterpreted Lipps in overemphasising the direct bodily component in his theory, for instance when stating that his ideas refer to 'inner imitation or inner resonance that is based on a natural instinct and causes us to imitate the movements and expressions we perceive in physical and social objects' (Coplan & Goldie, 2011, p. xii). Instead, Lipps's 'inner activities' do not seem to cause direct movements in observers but rather aim at experiencing facets of someone else's personality. The 'fusion' with another individual or object, nevertheless, has been criticised by Husserl (1900/1901) and Stein (1917), who argued that intersubjective reasoning relies more on conscious self–other distinctions (see Coplan & Goldie, 2011). Indeed, even acts of sympathy with others depend on a clear percept of another person, which helps to explain why more recent accounts of empathy highlight the component of perspective-taking. Lipps, nevertheless, attempted to provide an aesthetic theory of perception, which should primarily explain the aesthetic appreciation of the world rather than explaining ethical behaviour. In the following, I will describe a more recent theory of empathy that partially reflects Lipps's original ideas, and that can be applied to the domain of music performance and appreciation.

Stephanie Preston and Frans B. M. de Waal (2002) refer to Lipps's concept of feeling-into as a bodily response mechanism of empathy in human and non-human primates. Perceiving actions or states of other people should activate

representations that correspond with the observed actions or states of others. In turn, these representations may automatically trigger various bodily reactions such as changes in heart rate or other autonomic and somatic responses. By 'representation', Preston and de Waal (p. 54) do not refer to specified cognitive or symbolic contents but simply to general information storage systems. When comparing the proposed mechanism with the original concept of Lipps (1903), it becomes evident that they laid more stress on the body component, since Lipps emphasised the inner strives and urges rather than the direct physiological responses. Given Lipps's focus both on internal, non-physiological processes and on the all-embracing idea of grasping another individual's personality, feeling-into may only partially be regarded as a precursor of perception–action models.

The idea of linking perception and action, on the other hand, can be traced back to early ideomotor accounts of human behaviour (Lotze, 1852; Sperry, 1952). More recently, Wolfgang Prinz and colleagues provided behavioural evidence for perception–action couplings, culminating in the formulation of *Common coding theory* (Prinz, 1997), which postulates that the perception of movements and the potential execution of these movements share mutual representations ('common codes') in the observer's brain. As a consequence, motor familiarity with perceived actions should increase the internal responses and shape subsequent behaviour (cf. Wöllner & Cañal Bruland, 2010). Perception–action coupling is an automatic process that does not depend on conscious processing but requires some degree of attending to another individual's state or actions. The discovery of mirror neurons has been attributed to provide neurophysiological evidence for the link between perception and action (for a review, see Rizzolatti & Sinigaglia, 2010) and for the automatic, unconscious co-experience of others' emotions via internal simulation and imitation (cf. Decety & Ickes, 2009; Iacoboni, 2009).

According to Preston and de Waal's (2002) theory, empathic responses are based on these coupling mechanisms: perceiving someone move in a certain mood should resonate with the observer's own action representations and may lead to physiological responses. It should be noted that the link between perception–action systems and emotional responses remains rather elusive, since the type of physiological arousal is not specified and could be attributed to positive or negative emotions. Other researchers, nevertheless, indicate that internal simulation of others' actions could indeed be related to empathic emotional responses (Gallese, 2007; Gallese, Ferrari, & Umiltà, 2002; Molnar-Szakacs & Overy, 2006). On a neurophysiological level, the insula, connecting the limbic system with cortical areas associated with action representations, may have a fundamental role in this regard (Carr *et al*., 2003; Preston & Hofelich, 2012; Walter, 2012). A number of studies of empathy provided evidence that familiarity with someone else, as well as perceived similarity and salience of the observed actions or affect displays are likely to increase empathy (see Preston & de Waal, 2002). Furthermore, the higher processing speed of unconscious perception–action coupling facilitates interactions between individuals and may thus have benefits for social interactions in groups, which could be a basic function of empathy.

A perception–action approach to musical empathic interactions

Can musical performances be seen as an arena in which social couplings are exercised, by feeling-into the performers and by sharing mutual feelings with other members of the audience? A model is proposed (see Figure 5.1) to represent the musical empathic interactions between audiences, performers and music. Following embodied cognition approaches (cf. Leman, 2007), perception–action coupling lies at the heart of the model because it is central to (1) the social dimensions of empathy, including the more conscious perspective-taking, established through Audience interactions with Performers, (2) to co-performer empathy and feelings of agency, established through interactions between Performers and Music, as well as (3) attributions of a persona in music (Levinson, 2011), established through Audience interactions with Music. The model therefore reflects the ways in which audiences interact empathically with music (as a subject) and performers (as subjects) alongside the interactions between co-performers themselves.

Discussion about the role of perception–action coupling in musical empathic responses is given below according to a number of existing studies of joint actions between musicians in ensembles as well as between performers and audience members. Further evidence stems from audience research addressing audio–visual 'feeling-into' the performers in the domains of music and dance. Most of these studies correlated subscales or overall scores of empathy inventories with scores in experimental tasks.

In one of these tasks, jazz musicians, as expert listeners, were asked to indicate the perceived spontaneity of piano jazz recordings (Engel & Keller, 2011). Some of the melodies presented to them were improvised, while others were imitated. The overall differentiation accuracy was above chance (55 per cent correct). Individuals scoring higher on perspective-taking were better at differentiating between the two types of recordings. Although the expert

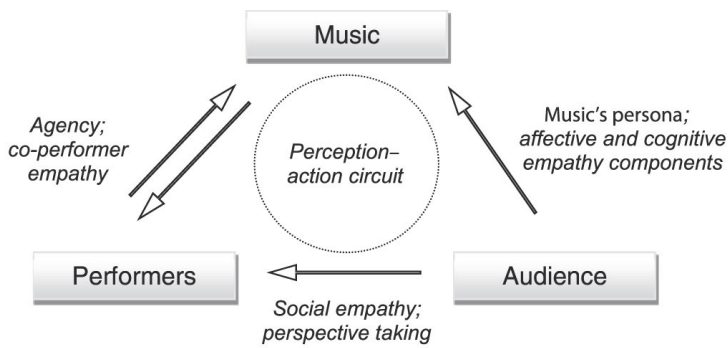

Figure 5.1 Proposed model of musical empathic interactions.

listeners of this study did not perceive the pianists' actions visually, nuances in the sound outcome of the performed actions sufficed for the detection of subtle differences, which was modulated by the cognitive components of empathy. When playing in an ensemble, skilled jazz musicians should also be able to respond to each other's improvisations and changes in timing. In a qualitative observational study, 'empathetic attunement' was seen as being crucial for such successful and spontaneous interactions between jazz musicians (Seddon, 2005, p. 56).

Undoubtedly, these empathic interactions between musicians should be manifest in neural activations of certain brain regions. Evidence for empathic perceptual effects of self-produced actions was provided in an electroencephalogram (EEG) study with jazz ensembles (Babiloni *et al*., 2012; see also Babiloni *et al*., this volume). The musicians' brain activation patterns were measured during the actual performance and while they viewed their own performances subsequently. In the observation condition, musicians with higher empathy scores showed activations in a right frontal region (alpha desynchronisation in Brodmann area 44/45). Since these activations were not present in non-musicians, the authors concluded that they are related to the empathetic attunement (to use Seddon's term) of expert musicians when observing their ensemble play and when interacting with others. A further study employed a musical duo paradigm to investigate empathy in relation to action representations of the complementary part of the music. Giacomo Novembre, Luca Ticini, Simone Schütz-Bosbach and Peter Keller (2012) asked amateur pianists to play the melodic lines of several Bach chorales in the right hand. In some conditions, a computer played back the bass line, while in others, no bass line was provided. The pianists were made to believe that the complementary left-hand part, if presented, was played by an actual pianist behind a screen. Transcranial magnetic stimulation (TMS) of the right motor cortex produced motor-evoked potentials for the left hand. These potentials were larger in conditions in which the pianists believed that they played along with another pianist. In addition, the cognitive perspective-taking scale from Davis's (1983) IRI correlated with increased motor-evoked potentials. The authors concluded that the social component of playing together was linked to empathy, which may facilitate action representations of others. Lipps's (1903) idea of feeling-into could thus hold true for cognitive response circuits.

In addition to studies of joint actions, researchers have addressed perception–action couplings that may underlie the emotional and empathic responses of audience members. If aesthetic appreciation of music is modulated by these processes, then empathy may have a role in the perception of a musical performance. The musicians' body movements provide hints about their expressive intentions, which, in turn, should be related to the musical sound outcome and could resonate in the audience members' bodily response systems. In a study based on Preston and de Waal's (2002) perception–action model of empathy, a string quartet was filmed from two perspectives during the performance of

Vaughan Williams's first string quartet in G minor (Wöllner, 2012). A particularly expressive part of the first movement (bars 48–97) was selected for further analysis. This part contained two sections as clearly marked in the original scores, with the second one having homophonic passages and a crescendo over several bars. Videos of the performances were produced under visual-only, auditory-only and audio–visual conditions, showing each member of the quartet individually. Some months after the performance, each member of the quartet judged continuously the level of expressiveness of themselves and their fellow performers. Auditory and visual grand average judgements were correlated, indicating that the musicians perceived strong parallels between their bodily performance movements and the music in terms of expressiveness. Independent observers were then asked to judge the performance under multimodal conditions, and difference values between the quartet's own average ratings and each observer's rating were calculated. For the second section of the music, empathy modulated judgements: that is, observers with higher affective empathy could better decipher the quartet's visual expressive intentions. Similarly, these observers' visual judgements matched the quartet's expressive intentions of the music more closely. In other words, the more empathic the observers were, the better they picked up the musicians' intentions as indicated by themselves in the previous judgements, and empathy did affect the perception of a musical performance.

A further study tackled the question of whether or not empathy is related to judgements of auditory cues derived from social versus non-social situations. In a study with jazz duets, Ana Pesquita, Timothy Corlis and James Enns (2014) asked musically trained participants and novices to indicate whether different jazz standards were recorded in live conditions, meaning that the two musicians played along with each other's performances simultaneously, or in dubbed versions with pre-recorded studio tracks. Participants also filled in Simon Baron-Cohen's (2002) Autism Quotient (AQ), a measure of social aptitude and, indirectly, of empathy. Results show that participants could differentiate between live and dubbed versions, yet differences in sensitivity measures (that is, the differences in ratings between live and dubbed versions) were observed between four ad-hoc groups of participants: musical novices with low social aptitude were not sensitive for the auditory differences between live and dubbed recordings, while novices with high social aptitude as well as musically trained participants (regardless of their aptitude) could successfully discriminate the recordings. This result was generally confirmed in a follow-up experiment that contrasted novices with musical experts from a school of music. For novices, the general AQ showed the highest correlations with judgement sensitivity, so people with high social aptitude could tell more reliably whether the musicians had performed simultaneously or not. Albeit not significant, absolute values in sensitivity measures were highest for 'social novices' and even higher than for the music groups. Musical experts with lower social aptitude, in contrast, did not significantly differ in solving the task than those experts with higher aptitude values. Pesquita, Corlis and Enns (2014) observed that results of the

systemising subscale of Baron-Cohen (2002) correlated particularly strongly with musicians' sensitivity to the social recording situation, leading them to conclude that musicians approached the given task differently by paying more attention to musical detail rather than 'using their intuition about social interactions' (p. 182).

While musicians may indeed engage with musical tasks in a different way compared to non-musicians and focus their attention more on technical aspects, it still remains surprising that musical expertise did not influence findings (compared to 'social novices'), in contrast to the social aptitude measures. According to the explanations provided by perception–action accounts of empathy, musicians should be able to internally feel nuances in joint live or dubbed performance situations. In other words, their experience with ensemble situations should allow for higher empathetic attunement. While Pesquita, Corlis and Enns (2014) indicate that only very few musicians had experiences as jazz musicians but all had ensemble experiences, they did not report their respective instruments. It might well be that the perception–action circuits are specific to the musicians' action domains, and that guitarists or clarinettists would have been more sensitive in judging the auditory cues of their own instruments in the duets. Such action-specific effects on perceptual accuracy were shown in a study of string musicians that synchronised better with the entries of a first violinist, compared to musicians of other instruments or non-musicians (Wöllner & Cañal Bruland, 2010).

Further research, on the other hand, suggests that empathy does not increase with musical training *per se*. Gunter Kreutz, Emery Schubert and Laura Mitchell (2008) developed a music-specific empathising–systemising measure based on an earlier inventory by Baron-Cohen (2002). Sample questions included (p. 72): 'I think that I can easily sense how performers feel while playing music' (musical empathising dimension) and 'I especially like the organised way that music is laid out' (musical systematising dimension). Three subgroups established according to musical expertise (professional, amateur or no performance experience) showed consistent differences in the systemising dimension but not in empathising. A follow-up study with a smaller sample and a condensed version of the questionnaire resulted in generally higher systemising as well as empathising scores in relation to musical expertise, although findings were less systematic than in the first study. Taken together, there is evidence that musicians develop specific cognitive styles in relation to their domain of experience that distinguishes them from others with no active experience in music performance. In a recent questionnaire study (Egermann & McAdams, 2013), being musically active was positively related to responses given to the question 'Did you empathise with the musicians you just heard?' (p. 144). Considering the manifold social interactions that playing in musical ensembles typically entail, influences on domain-specific forms of empathy should be further investigated.

Besides potential effects of active musical experience, audience members' empathic responses can to some extent be modulated even on a short-term basis.

Andrei Miu and Felicia Balteş (2012; see also Miu & Vuoskoski, this volume) found out that instructions on empathising with the performer influenced both the type of emotions perceived and the physiological reactions. While watching two commercial video tapes of Cecilia Bartoli, participants were instructed either to imagine 'how the performer feels … and try to feel those emotions themselves' or to 'take an objective perspective toward what is described in the music, and try not to get caught up in how the performer might feel' (p. 2; instructions adapted by van Lange, 2008). As a result, out of nine music-induced emotions from the *Geneva Emotional Music Scales* (Zentner, Grandjean, & Scherer, 2008), 'feelings of nostalgia' and 'power' were higher in the empathising condition. For one piece of music, skin conductance decreased, while for the other piece, respiration rates increased, suggesting some evidence for relationships with physiological arousal and the experimental instruction conditions. In self-judgements, most participants believed that the music rather than the performer's facial expression or the lyrics were the cause of their attunements. Although the impact of Bartoli's expressive gestures on observers' empathy cannot be ruled out in the experimental design, the main finding suggests that people can indeed consciously direct their levels of empathising with the musician by focusing on different aspects of the performance. In a follow-up study, 'dispositional empathy' – a concept somewhat debated, since empathy is generally not seen as a personality characteristic – was related to feelings of sublimity and unease that was also expressed in a live performance of a Puccini opera (Balteş & Miu, 2014). Empathy may thus enhance the experience of musically expressed emotions. Interestingly, visual imagery skills were related to the feeling of the same emotions, providing some support for the impact of visually perceivable and imaginable movements.

These studies support early theories of feeling-into other people's states when watching them move, or when hearing the corresponding sound outcome of the music they perform. More recent perception–action accounts of empathy further elucidate the advantage musicians may have in observing subtle nuances in performances that resonate with their own action systems. Studies so far used questionnaire approaches or controlled individual experimental sessions. It remains an open question as to whether the listening situation influences empathic responses. Since musical interactions are genuinely social experiences – whether real or with an imagined persona (see Levinson, 2011) – the social situation of listening and the co-presence of other audience members may further influence the ways people react empathically to music.

Aside from the evidence discussed above, music provides auditory and, in live performance contexts, also visual cues for actions that can lead to empathic responses. The perception–action theory of empathy should thus be valid for other performance domains that engender visual perceptions of actions (for a review, see Sevdalis & Raab, 2014). Perceiving a dancer move should resonate in the observers' motor systems, and empathy may modulate responses in relation to the emotional content expressed. Comparable to the field of music, potential links

between extensive dance training and enhancements in empathic responses were investigated. In an early study, Kalliopuska (1989) observed that young Finish ballet dancers aged nine to seventeen years had higher empathy scores compared to other students of the same age with no ballet training. She concludes that ballet dancers constantly train to express certain emotions, which would enhance their capacities for empathy.

Using a self–other paradigm, Vassilis Sevdalis and Peter Keller (2011) investigated relations between empathy and accuracy in judging agency and expression. Point-light displays were created from ten individuals dancing to funk music either expressively or with less expression. About half a year later, the same participants watched the point-light videos showing them or other individuals. Participants with higher overall empathy scores (according to the Davis inventory, 1980) were more accurate at indicating whether the point-light dancer had been them or someone else. In addition, participants were more successful at correctly indicating the intended expressiveness when they scored higher on the perspective-taking subscale. Taken together, participants were able to evaluate characteristics of human motion presented to them in very short films and with as little as thirteen body markers, which is in line with previous research showing that self–other distinctions are possible for information-rich motion such as free dancing (cf. Loula *et al*., 2005).

All participants in Sevdalis and Keller's (2011) study had danced themselves, so one could expect some resonance in their action system when observing the point-light actions. Yet those with higher general empathy scores benefitted more from these coupling processes. This finding raises the question as to whether empathy is indeed mainly grounded in perception–action couplings, or whether components of empathy enhance perceptions of oneself and others in a more abstract way. The first possibility would explain individual differences with regard to the training of these automatic coupling mechanisms. Individuals who are highly experienced in performing certain actions would be more empathic when observing the same actions. The second explanation assumes more indirect empathy effects in action observation of others that may be related to general trait empathy beyond specific domains of expertise. In a related study, even observers not involved in the production of the dance movements were able to judge the level of expressiveness as intended by the dancers, and empathy values correlated again with judgement accuracy (Sevdalis & Keller, 2012). Thus, there is tentative evidence that empathetic attunement to dance is not limited to a repertoire of actions and situations directly experienced by dancers.

Support for this claim stems from studies of individuals taking part in musical activities and tasks involving some form of synchronisation. These activities are supposed to enhance levels of general empathy and socially desirable behaviour beyond the specific domain or situational context. Compared to controls, children with musical training scored higher in an empathy inventory (Hietolahti-Ansten & Kalliopuska, 1990), and show a significant increase in

empathy scores after a year of musical training (Rabinowitch, Cross, & Burnard, 2013). Again, these results lead to the question as to whether musicians are indeed more empathic, perhaps by dealing with highly condensed emotions in music, and by synchronising their actions with others for a considerable time of their lives. To my knowledge, no large-scale study has reported higher general empathy scores in professional musicians (cf. Kreutz, Schubert, & Mitchell, 2008). This lack of data is worth considering in terms of what studies of pro-social outcomes share with other research on musical transfer effects, such as those addressing subcomponents of intelligence. One could argue that the effects in question are either rather short term and thus do not profoundly influence an individual's way of responding to other people or objects, or even that the levels of professionalism in musicians may potentially limit pro-social effects in the world of music business.

Conclusions

Investigating empathy in relation to music performance and perception may offer deep insights into fundamental questions of why and how people engage with music. The increased research interest in music and empathy coincides to some extent with what one could call the 'emotional turn' in the psychology of music. A large body of research attributes the significance of music to its emotional impact on many people's lives. For some researchers, feeling-into the perceived subject of the music – whether that is the performer, composer, or some abstract musical persona – and responding emotionally to the music defines the process of empathic behaviour. Those who feel the contagious influence of music more strongly should be particularly empathic.

There are limits to this view. Musicians may not constantly feel the variety of emotions they express musically and, equally, a listener will not necessarily be affected by all emotions a piece of music may embody. Music itself should not be reduced to its emotional impact (Langer, 1941), since it offers a number of important further experiences, among them the structuring of time, enabling perceptions of space and leading to numerous associations, or linking the past with the present. These experiences may coincide with emotions, yet often their experiential significance for a listener may not primarily depend on emotional loadings. Analytic listeners focusing on the musical structure at one extreme, or people hearing music with less attention in the background on the other, typically remain emotionally rather detached. Should they be less empathic than others? My argument here is that responses to music should not be equated with emotional contagion, since such a perspective would limit the plurality of possible aesthetic experiences.

In a similar vein, empathy should not be reduced to emotional contagion. A broader view was expressed in original theorising, philosophical accounts and psychological theory: empathy includes both low-level automatic components,

such as contagion, and higher-level conscious processes, such as perspective-taking, the latter showing some similarities to *Theory of Mind* (Walter, 2012; cf. Livingstone & Thompson, 2009), which is also addressed in Baron-Cohen's (2002) Autism Quotient. Only if cognitive elements are involved, then a full understanding of musical interactions and engagement can be reached. In this regard, Martha Nussbaum (2001) distinguishes empathy from 'compassion' by stating that 'empathy is simply an imaginative reconstruction of another person's experience, whether that experience is happy or sad, pleasant or painful or neutral' (p. 302). It should be noted that a number of the studies discussed above resulted in correlations with cognitive perspective-taking (Engel & Keller, 2011; Novembre *et al*., 2012; Sevdalis & Keller, 2011), thus supporting the argument for comprehensive research on musical empathy. Assuming a perception–action basis for empathy – such as formulated to some extent by Lipps (1903) and more recently by others as discussed above – provides a meaningful and fruitful way to see empathy as an important facet of social experiences, grounded in bodily processes and potentially leading to a deeper understanding of each other.

Do individuals' general levels of empathy explain their responsiveness to music and other forms of art? If so, then listeners who enjoy feeling with other people and taking their views to a greater extent should also appreciate performing arts more than others. Some researchers have recently argued for a genetic component of empathy (for a review, see Walter, 2012), suggesting that individual differences in empathic behaviour are indeed more stable than previously thought. These differences may shape the susceptibility to musical emotions (Vuoskoski *et al*., 2012). In other studies, researchers suppose that empathy can be enhanced, and call for 'empathy education' (Rabinowitch, Cross, & Burnard, 2013, p. 494; cf. Leman, 2007), which may result in specific music programmes for children. The consistent finding that women appear to be more empathic than men (Egermann & McAdams, 2013; Kreutz, Schubert, & Mitchell, 2008; for a review, see Sevdalis & Raab, 2014) could be both attributed to genetic differences as well as cultural influences. Therefore it is still not clear in what ways empathy may be modulated by musical involvement as a listener or performer. Based on perception–action accounts of empathy, however, there is tentative evidence that sustained training in social interactions – a key component of music performance – should result in fine-tuned skills when responding to others and imagining their thoughts and feelings. If such accounts are based on joint actions, is it also possible that empathy is enhanced in performing musicians, such as pianists, who are practising and performing primarily alone, and audience members who enjoy solitary listening? A potential explanation may lie in the imagination of a person (composer) or a persona in the music (Bach, 1753; Levinson, 2011). In this way, musicians playing solo as well as individual audience members may imagine their activity as being some form of social interaction.

Note

1 Translated by the author, as for all other translations from the German.

References

Babiloni, C., Buffo, P., Vecchio, F., Marzano, N., DelPercio, C., Spada, D., Rossi, S., Bruni, I., Rossini, P. M., & Perani, D. (2012). Brains 'in concert': Frontal oscillatory alpha rhythms and empathy in professional musicians. *Neuroimage*, *60*(1), 105–116.

Bach, C. P. E. (1753). *Versuch über die wahre Art, das Clavier zu spielen* (facsimile reprint, ed. L. Hoffmann-Erbrecht, 1969). Leipzig: Breitkopf & Härtel.

Balteş, F. R., & Miu, A. C. (2014). Emotions during live music performance: Links with individual differences in empathy, visual imagery, and mood. *Psychomusicology: Music, Mind, and Brain*, *24*(1), 58–65.

Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in Cognitive Sciences*, *6*(6), 248–254.

Bischof-Köhler, D. (2012). Empathy and self-recognition in phylogenetic and ontogenetic perspective. *Emotion Review*, *4*(1), 40–48.

Büttner, F. (2003). Das Paradigma 'Einfühlung' bei Robert Vischer, Heinrich Wölfflin und Wilhelm Worringer. Die problematische Karriere einer kunsttheoretischen Fragestellung. In C. Drude & H. Kohle (Eds.), *200 Jahre Kunstgeschichte in München. Positionen – Perspektiven – Polemik* (pp. 82–93). Munich: Deutscher Kunstverlag.

Carr, L., Iacoboni, M., Dubeau, M. C., Mazziotta, J. C., & Lenzi, G. L. (2003). Neural mechanisms of empathy in humans: A relay from neural systems for imitation to limbic areas. *Proceedings of the National Academy of Sciences (USA)*, *100*(9), 5497–5502.

Coplan, A. (2011). Understanding empathy: Its features and effects. In A. Coplan & P. Goldie (Eds.), *Empathy: Philosophical and psychological perspectives* (pp. 3–18). New York: Oxford University Press.

Coplan, A., & Goldie, P. (2011). Introduction. In A. Coplan & P. Goldie (Eds.), *Empathy: Philosophical and psychological perspectives* (pp. ix–xlvii). New York: Oxford University Press.

Davies, S. (2011). Infectious music: Music–listener emotional contagion. In A. Coplan & P. Goldie (Eds.), *Empathy: Philosophical and psychological perspectives* (pp. 134–148). New York: Oxford University Press.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *Journal Supplement Abstract Service Catalogue of Selected Documents in Psychology*, *10*(4), 85.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for multidimensional approach. *Journal of Personality and Social Psychology*, *44*, 113–126.

Decety, J., & Ickes, W. (Eds.) (2009). *The social neuroscience of empathy.* Cambridge, MA: MIT Press.

Egermann, H., & McAdams, S. (2013). Empathy and emotional contagion as a link between recognised and felt emotions in music listening. *Music Perception*, *31*(2), 139–156.

Engel, A., & Keller, P. E. (2011). The perception of musical spontaneity in improvised and imitated jazz performances. *Frontiers in Psychology*, *2*(83).

Gallese, V. (2007). Empathy, embodied simulation and mirroring mechanisms. Commentary on 'Towards a neuroscience of empathy' by Doug Watt. *Neuropsychoanalysis*, *9*(2), 146–151.

Gallese, V., Ferrari, P. F., & Umiltà, M. A. (2002). The mirror matching system: A shared manifold for intersubjectivity. *Behavioral Brain Sciences*, *25*(1), 35–36.

Hietolahti-Ansten, M., & Kalliopuska, M. (1990). Self-esteem and empathy among children actively involved in music. *Perceptual and Motor Skills*, *71*(2), 1364–1366.

Hume, D. (1793). *Treatise of human nature* (Ed. D. F. Norton & M. J. Norton, 2007). Oxford: Clarendon Press.

Husserl, E. G. A. (1900–1901). *Logische Untersuchungen (1. und 2. Teil).* Halle: Niemeyer.

Iacoboni, M. (2009). Imitation, empathy, and mirror neurons. *Annual Review of Psychology*, *60*, 653–670.

Kalliopuska, M. (1989). Empathy, self-esteem and creativity among junior ballet dancers. *Perceptual and Motor Skills*, *69*(3), 1227–1234.

Kreutz, G., Schubert, E., & Mitchell, L. A. (2008). Cognitive styles of music listening. *Music Perception*, *26*(1), 57–73.

Langer, S. (1941). *Philosophy in a new key* (3rd ed., 1957). Cambridge, MA: Harvard University Press.

Leman, M. (2007). *Embodied music cognition and mediation technology.* Cambridge, MA: The MIT Press.

Levinson, J. (2011). *Music, art, and metaphysics. Essays in philosophical aesthetics.* Oxford: Oxford University Press.

Lipps, T. (1883). *Grundtatsachen des Seelenlebens.* Bonn: Max Cohen & Sohn.

Lipps, T. (1885). *Das Wesen der musikalischen Harmonie und Disharmonie.* Heidelberg: Weiss.

Lipps, T. (1903). *Grundlegung der Ästhetik.* Hamburg and Leipzig: Leopold Voss.

Livingstone, S. R., & Thompson, W. F. (2009). The emergence of music from the Theory of Mind. *Musicae Scientiae*, *Special Issue 2009–2010*, 83–115.

Lotze, R. H. (1852). *Medizinische Psychologie oder Physiologie der Seele.* Leipzig: Weidmannsche Buchhandlung.

Loula, F., Prasad, S., Harber, K., & Shiffrar, M. (2005). Recognising people from their movement. *Journal of Experimental Psychology: Human Perception and Performance*, *31*(1), 210–220.

Mallgrave, H. F., & Ikonomou, E. (Eds.) (1994). Empathy, form, and space – problems in German aesthetics 1873–1893 [including translated writings by R. Vischer, K. Fiedler, H. Wölfflin, A. Goller, A. von Hildebrand, & A. Schmarsow]. Santa Monica, CA: University of Chicago Press.

Mead, G. H. (1934). *Mind, self, and society* (ed. C. W. Morris). Chicago, IL: University of Chicago Press.

Miu, A. C., & Balteş, F. R. (2012). Empathy manipulation impacts music-induced emotions: a psychophysiological study on opera. *PLoS One*, *7*(1), e30618.

Molnar-Szakacs, I., & Overy, K. (2006). Music and mirror neurons: from motion to 'e'motion. *Social Cognitive and Affective Neuroscience*, *1*(3), 235–241.

Novembre, G., Ticini, L. F., Schütz-Bosbach, S., & Keller, P. E. (2012). Distinguishing self and other in joint action. Evidence from a musical paradigm. *Cerebral Cortex*, *22*(12), 2894–2903.

Nussbaum, M. (2001). *Upheavals of thought. The intelligence of emotions.* Cambridge: Cambridge University Press.

Pesquita, A., Corlis, T., & Enns, J. T. (2014). Perception of musical cooperation in Jazz duets is predicted by social aptitude. *Psychomusicology: Music, Mind, and Brain*, *24*(2), 173–183.

Preston, S. D., & de Waal, F. B. M. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, *25*(1), 1–20.

Preston, S. D., & Hofelich, A. J. (2012). The many faces of empathy: Parsing empathic phenomena through a proximate, dynamic-systems view of representing the other in the self. *Emotion Review*, *4*(1), 24–33.

Prinz, W. (1997). Perception and action planning. *European Journal of Cognitive Psychology*, *9*(2), 129–154.

Rabinowitch, T.-C., Cross, I., & Burnard, P. (2013). Long-term musical group interaction has a positive influence on empathy in children. *Psychology of Music*, *41*(4), 484–498.

Rizzolatti, G., & Sinigaglia, C. (2010). The functional role of the parieto-frontal mirror circuit: Interpretations and misinterpretations. *Nature Reviews Neuroscience*, *11*(4), 264–274.

Seddon, F. A. (2005). Modes of communication during jazz improvisation. *British Journal of Music Education*, *22*(1), 47–61.

Sevdalis, V., & Keller, P. E. (2011). Perceiving performer identity and intended expression intensity in point-light displays of dance. *Psychological Research*, *75*(5), 423–434.

Sevdalis, V., & Keller, P. E. (2012). Perceiving bodies in motion: expression intensity, empathy, and experience. *Experimental Brain Research*, *222*(4), 447–453.

Sevdalis, V., & Raab, M. (2014). Empathy in sports, exercise, and the performing arts. *Psychology of Sport and Exercise*, *15*(2), 173–179.

Sperry, R.W. (1952). Neurology and the mind-body problem. *American Scientist*, *40*, 291–312.

Stein, E. (1917). *Das Einfühlungsproblem in seiner historischen Entwicklung und in phänomenologischer Betrachtung* (Unpublished doctoral dissertation). University of Freiburg, Germany.

van Lange, P. A. (2008). Does empathy trigger only altruistic motivation? How about selflessness or justice? *Emotion*, *8*(6), 766–774.

Vischer, R. (1872). *Über das optische Formgefühl* [On the optical sense of form: A contribution to aesthetics] (Unpublished doctoral dissertation). University of Tübingen, Germany (cited in Büttner, 2003).

Vuoskoski, J. K., Thompson, W. F., McIlwain, D., & Eerola, T. (2012). Who enjoys listening to sad music and why? *Music Perception*, *29*(3), 311–317.

Walter, H. (2012). Social cognitive neuroscience of empathy: Concepts, circuits, and genes. *Emotion Review*, *4*(1), 9–17.

Wölfflin, H. (1886). *Prolegomena zu einer Psychologie der Architektur* (Unpublished doctoral dissertation). University of Munich, Germany (cited in Büttner, 2003).

Wöllner, C. (2012). Is empathy related to the perception of emotional expression in music? A multimodal time-series analysis. *Psychology of Aesthetics, Creativity, and the Arts*, *6*(3), 214–233.

Wöllner, C., & Cañal-Bruland, R. (2010). Keeping an eye on the violinist: motor experts show superior timing consistency in a visual perception task. *Psychological Research*, *74*(6), 579–585.

Zentner, M., Grandjean, D., & Scherer, K. R. (2008). Emotions evoked by the sound of music: Characterisation, classification, and measurement. *Emotion*, *8*(4), 494–521.