

Music as affective scaffolding

Joel Krueger

Abstract

For 4E cognitive science, minds are embodied, embedded, enacted, and extended. Proponents observe that we regularly ‘offload’ our thinking onto body and world: we use gestures and calculators to augment mathematical reasoning, and smartphones and search engines as memory aids. I argue that music is a beyond-the-head resource that affords offloading. Via this offloading, music scaffolds access to new forms of thought, experience, and behaviour. I focus on music’s capacity to scaffold emotional consciousness, including the self-regulative processes constitutive of emotional consciousness. In developing this idea, I consider the ‘material’ and ‘worldmaking’ character music, and I apply these considerations to two case studies: music as a tool for religious worship, and music as a weapon for torture.

Keywords

4E cognition, consciousness, emotions, emotion regulation, musical worlds, materiality of music, music and worship, music and torture

<1>Introduction

4E approaches in cognitive science see mind as embodied, embedded, enacted, and extended. They observe that we routinely ‘offload’ our thinking onto body and world. Tilting our head to make sense of a rotated image or text, for example—

instead of rotating an internal representation—reduces information-processing demands (Risko and Gilbert, 2016). Similarly, we use gesture to represent solutions to mathematical problems (Goldin-Meadow, Nusbaum, Kelly, and Wagner, 2001), sketchpads to scaffold artistic creation (Loughlin, 2012), models to better understand scientific theories (Toon, 2015), and smartphones, search engines, and cultural institutions to support memory (Gallagher and Crisafi, 2009). These beyond-the-head targets of our offloading generate ongoing feedback loops that transform our cognitive profiles in real-time and, in so doing, help us negotiate complex cognitive tasks. From a 4E perspective, understanding how minds work requires looking beyond heads and taking into account the different ways bodily, social, and material resources scaffold access to new forms of thought and experience (Clark, 2008; Menary, 2010; Shapiro, 2011).

4E theorists have recently turned to music cognition: from work on music perception (Clarke, 2005; Kersten, 2014; Krueger, 2009, 2011a; Leman and Maes, 2015; Matyja and Schiavio, 2013) and musical emotions (Cochrane, 2008; Krueger, 2014a, 2014b; Schiavio, van der Schyff, Cespedes-Guevara, and Reybrouck, 2016; van der Schyff and Schiavio, 2017; Witek, Clarke, Wallentin, Kringelbach, and Vuust, 2014), to improvisation and music education (Elliott and Silverman, 2015; Geeves and Sutton, 2015; Schiavio and Høffding, 2015). In this chapter, I continue this trend. I argue that music, like other tools and technologies, is a beyond-the-head resource that affords offloading. And via this offloading, music can (at least potentially) scaffold access to new forms of thought, experience, and behaviour. I focus especially on music's capacity to scaffold *emotional consciousness*, including the self-regulative processes constitutive of emotional consciousness—although I will say some things about how music can scaffold other cognitive processes, too. In

developing this idea, I consider two aspects of music that have been largely overlooked in the philosophical literature: its ‘material’ and ‘worldmaking’ character. And I apply these considerations to two cases studies: music as a tool for religious worship, and music as a weapon for torture.

<1>Music as material for worldmaking

Philosophers often portray music, along with the practices by which we engage with it, as largely distinct from everyday life. For example, Peter Kivy argues that the liberating power of music comes from ‘its complete freedom from connection with our workaday world and its problems’ (Kivy, 1997, p. 209). Alvin Goldman defends a similar view. He assumes (‘without further comment’) that the social dimension of live music, for instance, is ‘not a primary value for most concert goers’ before defending his central claim that music is more detached from the real world than other art forms, and that this detachment is ultimately the source of the great value we place on music and musical experience (Goldman, 1992, p. 35).

While we might engage with music in this relatively ‘worldless’ manner—I can put on headphones, turn off the lights in my bedroom, and lose myself in a solitary musical experience—it does not follow that this is our *default* way of engaging with music.¹ Moreover, the worldless picture of musical engagement that Kivy and Goldman endorse is not well-equipped to capture the situated character of our most common musical practices, many of which involve others—such as listening while worshipping, studying, exercising, or deliberately using music to enrich an individual or collective emotional experience. In these and many other cases, music is something we interact with and bring into use (Clarke, 2005; Krueger, 2011a, 2015a;

¹ Even these solitary forms of listening, however, are not truly ‘worldless’. They occur in specific listening contexts, and involve artefacts, practices, associations, and preferences that reflect the listener’s sociocultural ecology and shape how they perceive and interpret the music (Clarke, 2005, pp. 126-155).

Menin and Schiavio, 2012; Rentfrow, 2012). In other words, we encounter music as *material*—an ‘aesthetic technology’ (DeNora, 2000)—that we put to work in actively driving experience and behaviour.

Consider portable listening technologies like MP3 players and smartphones, along with the streaming music services that flow through them (Bull, 2000). These are portable and personalized technologies for on-demand ‘self-care’ (Skånland, 2013). We use them to craft transient, site-specific soundworlds specifically to regulate emotional consciousness, whether at work, play, or rest. And because we have these technologies with us constantly, musical interactions are no longer infrequent occurrences; they are never more than a touchscreen away. If I feel my energy flagging and need an affective boost to propel me through a strenuous workout, I can scroll through my MP3 player until I find just the right track, or simply issue a voice command telling my smartphone to play some upbeat music (Fritz et al., 2013). Similarly, if the energy begins to drop at a party, a well-chosen track can instantly revitalize the atmosphere and animate dancing and further conversation. Because music is materialized in an array of portable technologies, it is thoroughly interwoven into everyday activities—from reading and writing to cooking, exercising, shopping, socialising, worshipping, resting, and commuting.

So music is something we do things with. And one of things we routinely do with music is construct and organize *space*. In other words, we make musically-structured environments to inhabit, explore, and manipulate (Bull, 2007). This ‘worldmaking’ dimension of music flows from its materiality. Because music is materialized in aesthetic technologies, we can use it to manipulate physical and social spaces—again, think of playing specific music to set the right atmosphere at a party, or in a waiting room, restaurant, or retail space—as well as create

individualized soundworlds nested *within* these spaces. For example, office workers in shared or open plan office settings routinely use music to construct ‘auditory bubbles’ (Dibben and Haake, 2013; Eriksson, Atienza, and Pareto, 2017). These private soundworlds reclaim individual space, block out environmental distractions by creating a preferred auditory environment conducive to work, and provide resources to help manage attention, affect, and energy.

The spatial or worldmaking power of music also comes through in how we talk about music and musical experience. For example, when talking about pitch organization—a uniquely musical feature—we rely on spatial contrasts like ‘up and down’, ‘high and low’, ‘small and large’, etc. (Eitan and Timmers, 2010; Morgan, 1980). Spatial and movement metaphors are also central in descriptions of our strong emotional responses to music: ‘sad music helps you enter your own true feelings’ (Peltola and Saesma, 2014, p. 298); ‘suddenly I was in some inexplicable way drawn into the music. It felt as if I was somehow lifted up from my seat and sort of floated in the room...’; ‘The music crawled inside me; or was it me that crawled inside the music? In some way that was all that existed’ (Gabrielsson, 2011, pp. 79–80).

These descriptions should be read as more than metaphors. They highlight the extent to which the experience of space is a constituent feature of musical consciousness (Krueger, 2011b). The phenomenologist Maurice-Merleau-Ponty was attuned to this spatial or worldmaking character of music, as when he wrote:

a piece of music comes very close to being no more than a medley of sound sensations: from among these sounds we discern the appearance of a phrase and, as phrase follows phrase, a whole and, finally, as Proust puts it,

a world. (Merleau-Ponty, 2004, p. 99)

In the concert hall, when I reopen my eyes, visible space seems narrow in relation to that other space where the music was unfolding just a moment ago, and even if I keep my eyes open during the performance of the piece, it seems to me that the music is not truly contained in this precise and shabby space. The music insinuates a new dimension across visible space where it unfurls just as, for persons suffering hallucinations, the clear space of perceived things is mysteriously doubled with a 'dark space' where other presences are possible. It brings a new dimension stealing through visible space, and in this it surges forward... (Merleau-Ponty, 2002, pp. 257–258)

A way of interpreting Merleau-Ponty's potentially cryptic remarks here is to see them as his attempt to distinguish two forms of spatial content intrinsic to musical consciousness—both of which are important for understanding music's worldmaking character and its ability to manipulate emotions, as we will see below. On one hand, we hear music as an event located in the environment. This is to perceive music's *locational* spatial content—to hear music as coming from somewhere in 'visible space', as Merleau-Ponty puts it (e.g. the stereo in the next room, the tinny smartphone speaker three rows behind me on the bus, or the audio system of the car driving by my house). Locational spatial content specifies music as an event situated in the environment, located in relation to listeners and other things and events. Because music bears locational spatial content—and is materialized in artefacts like MP3 players, speakers, and instruments—it can be selectively positioned in the world and used to alter its structure (recall the 'auditory bubble' example above).

But Merleau-Ponty also highlights a second form of spatial content intrinsic to musical consciousness particularly relevant to present concerns: the inner *structural* space of music. This inner space is a property that individuates music *qua* music in contrast to other sound events in the environment. For example, while we also tend to hear other sounds as bearing locational spatial content—I hear the hum of the fan *by the window*, the whine of the washing machine *in the laundry room*, or the laughter of children playing in the grass *outside my office*—music becomes present to consciousness in a different way. We hear it as also having a distinctive internal spatial complexity. It is perceived as a structurally organized soundworld that can be *inhabited*, experientially, in a way many other sounds cannot.² What this means is that we hear musical elements like tones, melodies, rhythmic progressions, and textures as meaningfully arranged to hang together in a particular sort of way. This ‘hanging together’ establishes a musical event’s distinctively musical profile, its coherence as a musical event. And it renders music *meaningful* insofar as it immediately shows up for us not as random noise but as a phenomenologically rich sounding environment intentionally crafted to invite different forms of perceptual and behavioural engagement (Clarke, 2013; Reybrouck, 2015). Phenomenologically, the dynamic interplay between locational and structural musical space is, I suggest, a central reason why music becomes present to consciousness with its distinctive character and meaning.³

² Of course, this may not equally be the case for all forms of music such as noise music or avant-garde electronic music consisting of pure tones, electronic signals (feedback, distortion, tape hiss), or music with a minimal or randomly-generated structure (e.g. a few irregular blips or industrial sounds punctuated by long stretches of silence). Alternatively, non-musical field recordings of natural or artificial landscapes may, like music, also become present to consciousness as rich sounding environments inviting further exploration. Part of the philosophical curiosity of music and sound comes from trying to account for these sorts of challenging cases.

³ These considerations also help clarify why amusiacs—who show a deficiency processing pitch variation despite normal speech perception and intact sense of rhythm—tend to describe music as unpleasant, unstructured noise (McDonald and Stewart, 2008; Sacks, 2007). There is evidence that

In sum, our experience of music *qua* music involves the perception of musical space, a musical world. Moreover, because music is mediated materially (for example, by aesthetic technologies), we can *do things with it*—including manipulating the spaces of our environments and, simultaneously, ourselves. By virtue of its materiality, music integrates with and dynamically reorganizes physical and social spaces, opening up new possibilities for musically-scaffolded experience and action.

<1>Offloading and musical worlds

Music's material and worldmaking character are what enable music to function as beyond-the-head scaffolding that affords offloading. As will become clear, sometimes this offloading is voluntary, and sometimes it is not. Two case studies will help clarify this idea: music as a tool for religious worship, and music as a weapon for torture.

<2>Music and worship

Music has long been central to religious practice (Wynn, 2004). When we enter a church, mosque, or temple, we enter not just a religious but also a musical space, in which we may find soundworlds fashioned specifically to demarcate that space as sacred and to scaffold religious emotions, beliefs, memories, and behaviour.

There is a well-established connection between music and emotion regulation. The latter refers to processes by which we determine which emotions we

amusia involves, among other things, an inability to represent space (Cupchik, Phillips, and Hill, 2001; Douglas and Bilkey, 2007; Särkämö et al., 2009). When the spatial content of music is no longer present to consciousness, music loses its distinctively musical character. For a different view of amusia and space, however, see Tillmann et al. (2010).

have, when and how long we have them, and how these emotions are experienced and expressed (Gross, 1999). Emotions are complex phenomena comprised of multiple integrated dimensions: an *appraisal* dimension, for instance, as well as an *agentive* or action-readiness dimension, a *physiological* dimension, and an *expressive* dimension (Parkinson 1995). But emotions also have a *regulatory* dimension. And if, as some argue, emotion-regulative and emotion-generative processes are inextricable—Frijda (1986); Tomkins (1984)—processes of emotion regulation are partially constitutive of emotional consciousness. In other words, how an emotion *feels* reflects the manner by which it is *regulated* (Krueger, 2015b).

Traditionally, emotion regulation has been seen as a process that occurs almost entirely inside people's heads (e.g., Gross, 2015). But this individualistic perspective overlooks emergent qualities of emotion regulation and experience that are scaffolded by an individual's ongoing engagement with features of their environment (Koole and Veenstra, 2015), including their musical environment (van der Schyff and Schiavio, 2017). As already discussed, we use music throughout our lives and in many different contexts, including religious worship, to regulate our emotions (Saarikallio, 2011). We do this because music is an aesthetic technology especially well-suited for this task. Its dynamic and temporal nature, along with its deep bodily impact on listeners—the fact that musicking enacts continuous feedback loops of musical 're-soundings' (Nancy, 2007), from vibrations in our bones and muscles to complex patterns of neurophysiological and behavioural entrainment—means that we are quite literally bodily and affectively *captured* by the musical worlds we construct and inhabit. These worlds pull emotional responses out of us and regulate the character of their unfolding.

This picture is supported by a great deal of empirical work. For example, neuroimaging studies have found that musical responses involve many of the same brain regions involved in generating, detecting, maintaining, and regulating emotions (Blood, Zatorre, Bermudez, and Evans, 1999; Koelsch, 2014; Overy and Molnar-Szakacs, 2009). But music affects more than just our neurons. Musicking—whether listening alone with headphones, during a religious service, or dancing with thousands of people at a festival—is a richly cross-modal and whole-body experience involving embodied expressions (facial expressions, gestures, and other bodily movements) central to emotional consciousness (Laird, 2007; Maiese, 2011). Exploring the details of these processes would take us too far afield (see Krueger (2014a) for an in-depth discussion). For now, we can simply note that even when we are supposedly ‘passively’ listening, we are still interactively engaged with the music at multiple levels of our embodiment: our motor system is involved in processing musical rhythms (Chen, Penhune, and Zatorre, 2008; Grahn and Brett, 2007); we make spontaneous facial expressions when listening to expressive music, including non-vocal music (Chan, Livingstone, and Russo, 2013; Lundqvist, Carlsson, Hilmersson, and Juslin, 2009; Witvliet and Vrana, 1996); and we spontaneously entrain our movements, gestures, and facial expressions (from subtle head bobs and toe taps to full-blown ecstatic dancing) with musical elements like rhythm and melody, and in so doing become intimately ‘coupled’ with the music and things happening in it (Iyer, 2002; Janata, Tomic, and Haberman, 2012; Witek et al., 2014).

In this way, then, the musical worlds we inhabit elicit and directly modulate a cascade of emotion-specific processes at neurophysiological, behavioural, and experiential levels. The important point here is this: via iterative cycles of motor entrainment and synchronization unfolding in response to musical features, musical

worlds pull emotions out of us and regulate their dynamics *in real time* as they unfold over short- and long-term listening episodes (Elvers, 2016; Janata et al., 2012; Windsor and de Bézenac, 2012). Music thus functions as environmental scaffolding, that is, as part of our extended (beyond-the-head) emotion-regulatory system. The music we play, or that is played around us (e.g., in spaces of worship), becomes part of a listener-environment feedback loop that drives, structures, and regulates the character and development of our emotional consciousness. This is, I suggest, a case of musically-scaffolded emotional offloading. We let music take over self-regulatory dynamics that would normally fall within the scope of our own internal capacities and, via this offloading, let it do some of the emotional work for us (Krueger, 2014a, 2014b).

To make this idea more concrete—and to return to music and worship—consider music at a religious funeral. The musical soundworld of a funeral has a number of functions (Clarke, Dibben, and Pitts, 2010, pp. 1–8). Solo organ music before the service masks environmental sounds and demarcates the physical space of the funeral as different from the ‘everyday’, provides aural privacy for attendees, and guides attention and focus as the service begins. A funeral’s soundworld is also selected to scaffold and regulate the experience and expression of appropriate emotions. Loud up-tempo pop music would normally be considered inappropriate, unless specifically requested by the deceased. So, slower reverent musical works—Christian hymns like ‘Abide with Me’, for example, or classical pieces like Elgar’s Variations, Pachelbel’s Canon in D Major, or Verdi’s Requiem—are chosen for their capacity to establish an affective atmosphere gently nudging participants toward quiet grief and introspective remembrance.

But not all funerals are sombre affairs. Within the Southern Baptist tradition in the United States, African American funerals often begin with mournful hymns and prayer. But they soon transition into something very different: joyful celebrations of the deceased's reunion with Christ, complete with shouting, singing, and dancing that spills out of the pews and into the aisles. These emotional displays are scaffolded by up-tempo praise hymns. The musical soundworld organizes and guides this transition, actively driving participant's emotions and behaviours, both individually and collectively, as they pass through various phases of this process. Via the entrainment responses discussed previously, rhythmic and tonal properties of the music pull embodied responses out of attendees directly connected with positive and uplifting emotions and regulate how these emotions unfold over the course of this episode. This is a full-bodied engagement with musical scaffolding. As Clarke and colleagues note, '[t]he very act of singing, involving deliberately deep breathing, the increased muscle tone associated with standing up, and the concentration required to follow the words and music, also bring together physiological and psychological phenomena commonly used to help people cope with, and overcome, strong negative emotions' (Clarke et al., 2010, p. 6).

Other forms of musical offloading can be found within religious contexts. For example, music scaffolds *social cognitive* processes, such as social bonding, by synchronizing moods and emotions of a large number of people—again, via the entrainment processes discussed previously (Clarke, DeNora, and Vuoskoski, 2015; Launay, 2015; Reddish, Fischer, and Bulbulia, 2013). And these musically scaffolded moods and emotions in turn regulate the large-scale synchronization of joint action and behaviour. This is a central *ritualistic* function of music. Rituals are patterns of organized behaviour that follow a prescribed form. They can unfold at multiple time-

scales, from moments to years or a lifetime, and can involve a few people or many. Music often plays a crucial role in driving the different practices and behaviours constitutive of religious rituals. Musical qualities like rhythm, melody, and pulse order the temporal sequence of a worship service and organize behavioural coordination between participants. They do this by providing external time-keeping cues enabling groups to move and act in time, as one (Clarke et al., 2010, pp. 2–3). For example, in a Christian service, organ or choral music signals when to sit, stand, kneel, pray, or greet one's fellow worshippers; musical cues also signal the start of the gospel reading, tell participants when to approach the front of the church for communion, and even determine what sort of actions are appropriate during a particular phase of the service (e.g., when walking back to one's pew after communion versus post-worship mingling).

In this way, music encodes action scripts constitutive of a given ritual or service of worship. Instead of participants having to remember each and every movement or practice, they can offload this responsibility onto the music by letting it take over and govern their behaviour. Music thus materializes ritualistic time. Musical dynamics are external representations indicating that things are happening *right here, right now*; and these dynamics tell listeners what to do and when to do it (Rouget, 1985).

Canonical music in this way preserves ritualistic practices and action scripts over many generations, scaffolding not just individual or even collective but also intergenerational memory. Songs, hymns, chants, and sung prayers continually remind worshippers of their religious duties and actions; and as we have seen, they elicit and regulate appropriate moods or emotional responses. But they also preserve and communicate the stories, myths, legends, beliefs, and practices of a

religious tradition across multiple generations. Rhythms and melodies chunk words and phrases, for example, identify line lengths and stress patterns, and also help listeners focus on and recall important words of a text, such as those found in a religious scripture or creed (Wallace, 1994). In sum, in addition to its impact on emotional consciousness, music is a memory technology that scaffolds processes of learning, retrieving, remembering, and reconstructing the rituals and texts constitutive of our religious life.

<2>Music and torture

Inhabiting religious and musical spaces is generally a voluntary and uplifting affair. Worshippers create and inhabit these environments in order to enrich their own musically scaffolded experiences and share them with others. But not all instances of musical offloading have these positive qualities. Music weaponized as an instrument of torture is one such case—and it reaffirms music’s potency as affective scaffolding.

Consider prisons. Prisons are complex soundworlds, and very noisy environments. The jangling of keys carried by prison guards, the banging of heavy prison doors, the shouting and screaming of guards and unruly prisoners, the barking of patrol dogs, and the loud music blaring from radios all contribute to an unpleasant soundworld amplified by the austere space of the prison environment (Archer, 2002; Carlton, 2007). This takes its toll: long-term exposure to prison noise has been linked to deafness (Grossman, Kerr, and Byrd, 1996), and has led some to argue that the intensity and unpredictability of prison noise, along with prisoners’ relative powerlessness to do much about it, is another form of punishment and suppression of their agency (Cusick, 2013; Rice, 2016).

However, prisoners can, at times, exert their acoustical agency by creating personalized soundworlds with music. Recently, some prisons have given prisoners MP3 players as a reward for good behaviour (Kirkpatrick, 2013). They quickly become prisoners' most prized commodity—used to create 'auditory bubbles', as in office environments, to reclaim individual space, bring order to an unpredictable sonic environment, and regulate affect. But prisoners also weaponize these MP3 players and the soundworlds they create. Loud rap music played through portable speakers attached to these MP3 players can be a hostile gesture, a means of demarcating territory through sound and deliberately inflicting stress, sleep deprivation, and negative affect on others (Rice, 2016). The playing of loud music is the most common cause of fights among inmates (Archer, 2002).

But music can be weaponized in an even more damaging way. It is well-established that the United States military uses music as an element of 'harsh interrogation' in the so-called 'global war on terror' (Bayoumi, 2005; Cusick, 2013; Peisner, 2006). High value detainees are routinely subjected to punishingly loud music for hours or days at a time via loudspeakers in individual cells and interrogation rooms or positioned just outside communal prison blocks—with prisoners often standing or kneeling in an uncomfortable posture. Media accounts tend to downplay the severity of these techniques, focusing not on the character of the experience but rather on the amusing juxtaposition of artists found in the playlists (e.g., Barry Manilow, Slayer, Eminem, the theme song from the American children's programme *Barney the Dinosaur*). But music is a powerful technology for torture. It is telling that victims find the predictability of physical violence preferable to the unpredictability of musical torture (Grüny, 2012).

To better understand the phenomenology of musical torture and how (involuntary) offloading is central to the experience, two points are worth noting. First, as Grüny (2012) observes, sounds—particularly musical sounds—seem to *penetrate* consciousness in a qualitatively deeper way than input from other perceptual modalities. As he puts it, ‘the audible is organized around degrees of intensity, and it seems to imply a rather different relation between activity and passivity’ than we find in other experiences (Grüny, 2012, p. 209). If I am in a brightly lit room or outside in direct sunlight, say, I can move to shade or cover my eyes and enjoy some relief; similarly, I can plug my nose and escape an unpleasant odour or shift my body away from an irritating tactile sensation. While we do, of course, have some autonomy over the intensity of our auditory experiences, we also seem uniquely vulnerable to sounds. This is because we *resonate* with sounds—particularly music—down to our bones (Cusick, 2008). Music played at high volume bombards listeners’ bodies with relentless acoustical energy, and, as we have seen, elicits an array of neurophysiological and behavioural entrainment responses over which they have little control and which are directly linked to emotion regulation. This aspect of music’s materiality makes it an especially powerful tool for control and domination.⁴

Second, and relatedly, we often enter and become deeply affected by shared musical worlds not of our making. Focusing on MP3 players as technologies of self-

⁴ Of course, we also ‘resonate’, in deep and powerful ways, with input from other perceptual modalities, too. There is evidence that smells, for example, trigger intense emotionally-tinged autobiographical and episodic memories (Herz, Eliassen, Beland, & Souza, 2004; Saive, Royet, & Plailly, 2014), such as the negative emotions experienced by those suffering from posttraumatic stress syndrome (PTSD) (Vermetten & Bremner, 2003). However, the multi-level (i.e., neurophysiological, behavioural, and phenomenological) entrainment responses that music elicits mean that we are drawn up into musical worlds in a manner distinct from, say, the olfactory environments we inhabit. I invite the reader skeptical of this point to imagine being locked in a room with an unpleasant odour continuously pumped in via a vent versus being in that same room while music is continuously played at a punishingly high volume. Neither experience would be pleasant. But my intuition is that the former would be the more bearable of the two scenarios, in part because we can actively modulate our exposure to smells (i.e., how much we let inside of us) to a greater degree than we can music.

care might lead us to think of musical worlds as primarily solitary environments. But as the discussion of music and worship has highlighted, musical worlds are often collaboratively constructed environments. And musical worlds created by others often co-opt our attention and emotions, and regulate our behaviour in deep and subtle ways—even if we are not aware that it is happening. For example, background music while shopping influences what consumers buy and how much they are willing to pay for their purchases (Areni and Kim, 1991; North, Sheridan, and Areni, 2016; Turley and Milliman, 2000).

To return to music and torture: these cases of weaponized musical worlds are powerful examples of what Jan Slaby calls ‘affective mind invasion’ (Slaby, 2016). Affective mind invasion occurs when an individual’s affective and emotional dispositions fall in line with the interaction routines of their local subcultures. The latter refers to things like corporate workplaces, social web-based groups, academia, the world of sports, or police and military culture. Over time, individuals within these domains adopt idiosyncratic ‘affective styles’: ways of speaking, gesturing, and moving, patterns of interpersonal interaction, emotional experience and expression, etc., that are normative in the domain in question (Colombetti and Krueger, 2015). Individuals are affectively ‘invaded’ to the extent that these styles can regulate thought and behaviour without their full awareness or consent.

Musical torture is a particularly brutal case of affective mind invasion. Part of its brutality comes from the fact that aspects of one’s bodily-affective style—and emotional consciousness more generally—are not so much reconfigured as they are dismantled and destroyed. Prisoners are drawn up into (scaffolded by) a hostile musically extended self-regulatory system without their consent. Their subjectivity,

their ability to self-regulate thought and emotion, is co-opted and absorbed by a weaponized musical world not of their making.

Reports suggest that much of prisoners' disorientation comes from the fact that music played so loudly and repeatedly is drained of its aesthetic qualities and instead becomes an all-consuming violent sound. The individual can no longer selectively attend to or pleasurably entrain with qualities like melody or rhythm. Instead, their agency is diminished and they are completely subsumed by the music:

after a while, you don't hear the lyrics, all you hear is heavy, heavy banging ... you can't concentrate on the drums, or what the person's saying, all you hear is just loud shouting, loud banging, the metal clashing against metal ... It doesn't sound like music at all. (Cusick, 2008, p. 3)

Another individual describes the isolating character of the experience: the removal of access to external cues, such as voices and other sounds, that normally situate us in a physical and social world:

Nothing focused in terms of, like, let me think now of, for example, a topic or story. Nothing comes to your head: it's just that the experience you're going through is so intense...that it takes you away from everything else, everything else besides it. (Cusick, 2013, p. 287)

In contrast to the timekeeping function of music in religious worship, music in the context of torture is used specifically to *disrupt* the subject's experience of time and remove connections with the physical and social world. Even when the music eventually stops, the inmate above reports feeling like a cat 'just turning in a spot, saying "What's going on? What's going on?"' (ibid., p.287)

Other prisoners affirm the materiality of music as an active force in the world: ‘You feel like your body is being bombarded with something ... It’s like you’re being hit with a hammer, din din din din. When it stops, it’s like a beating has stopped’ (ibid., p. 288). When played at a high volume for extended periods, music’s acoustical energy becomes, Cusick tells us, ‘a vibrating presence of power that can deliver a miraculously ubiquitous battering to the sympathetically vibrating bones and skin of a man, beating him from within and without, while leaving no marks’ (ibid., p. 288).

This process of affective mind invasion destroys the individual’s sense of interiority and exteriority, private and public. By forcing the individual to unwillingly offload self-regulatory processes onto a hostile musical world not of their making, the music removes individual agency and consent. Prisoners are, accordingly, drawn up into a musically extended system crafted not to augment and enhance but rather dismantle and destroy.

<1>Conclusion

My case studies—despite their many differences—both highlight the deep way music can take over and regulate various processes responsible for the development, maintenance, and control of our embodied subjectivity. More specifically, both show how self-regulative processes responsible for generating and maintaining emotional consciousness can be offloaded onto the musical worlds we inhabit. Sometimes, as in the case of music and worship, this process happens voluntarily, within musical worlds of our own making; in other cases, however, this offloading is involuntary, and involves musical worlds others create for us—and even use *against* us. Music and

torture provides a powerful example of the latter. Two qualities of music—its material and worldmaking character, often overlooked by philosophers of music—are what enable music to function as affective scaffolding in this way.

There are several points in conclusion. First, philosophers of music, I suggest, ought to take their lead from music sociologists and psychologists and pay more attention to the situated nature of our everyday musical practices—the fact that music is something we regularly *do things with*. One of the main things we do with music is actively use it to manipulate our emotional consciousness. This enactive way of thinking about music and emotions has only recently found a prominent place within philosophical debates. But this is where 4E cognition can help. Broadening the scope of inquiry to include not just experiences like attending a symphony orchestra but also musical practices embedded in everyday contexts of work, play, learning, and rest will benefit from further engagement with 4E cognition, which is committed to understanding how the dynamics of cognition and emotion arise within these contexts. A particularly fruitful avenue of future research here might be the role of music in scaffolding affective processes involved in pedagogy and learning (Elliott and Silverman, 2015). For example, there is suggestive evidence that musical engagements—both scripted and spontaneous music making, as well as music listening and dancing—can play a crucial role in deepening young learners' self-understanding, empathy, and sensitivity to their sociocultural milieu (van der Schyff, Schiavio, and Elliott, 2016).

Second, this picture of music as affective scaffolding seems to lend support to some of the more radical strands of 4E cognition. These strands include those who see a wide variety of psychological states and processes—including consciousness and emotions—as partially constituted by beyond-the-head factors. Traditionally,

some prominent 4E proponents sympathetic to the idea that cognitive processes such as believing and remembering can extend beyond the head via the input of environmental resources (e.g., notebooks, smartphones, cultural institutions and practices, etc.) stop short of endorsing the idea that conscious states might be similarly extended (Clark, 2009; cf. Ward, 2012). However, this reluctance is starting to change (Rowlands, 2015; Vold, 2015)—particularly in the realm of emotions (Carter, Gordon, and Palermos, 2016; Colombetti and Roberts, 2015; Krueger and Szanto, 2016; Roberts, 2015; Slaby, 2014). Given the ubiquity and variety of our musical practices, as well as the tight connection between music and emotions, music ought to be a core focus of these externalist trends in the philosophy of emotions. Musical worlds shape emotional minds. Understanding the latter requires looking beyond the head, into the soundtracks of everyday life.⁵

⁵ I am very grateful to Eric Clarke and David Clarke for their thorough comments on earlier versions of this chapter. Their feedback greatly improved my thinking about these issues. My thanks also to audiences in Berlin, Irvine, and Brussels for helpful feedback on talks related to this material.

References

- Archer, J. (2002). *A Prison Diary*. London: Macmillan.
- Areni, C. S., and Kim, D. (1991). The Influence of Background Music on Shopping Behavior: Classical Versus Top-Forty Music in a Wine Store. *Advances in Consumer Research. Association for Consumer Research*, 20, 336–340.
- Bayoumi, M. (2005, December 8). Disco Inferno. Retrieved October 16, 2016, from <https://www.thenation.com/article/disco-inferno/>
- Blood, A. J., Zatorre, R. J., Bermudez, P., and Evans, A. C. (1999). Emotional responses to pleasant and unpleasant music correlate with activity in paralimbic brain regions. *Nature Neuroscience*, 2(4), 382–387.
- Bull, M. (2000). *Sounding Out the City: Personal Stereos and the Management of Everyday Life*. Oxford: Bloomsbury Academic.
- Bull, M. (2007). *Sound Moves: iPod Culture and Urban Experience*. London; New York: Routledge.
- Carlton, B. (2007). *Imprisoning Resistance: Life and Death in an Australian Supermax*. Sydney: Institute of Criminology Press.
- Carter, J. A., Gordon, E. C., and Palermos, S. O. (2016). Extended emotion. *Philosophical Psychology*, 29(2), 198–217.
- Chan, L. P., Livingstone, S. R., and Russo, F. A. (2013). Facial Mimicry in Response to Song. *Music Perception: An Interdisciplinary Journal*, 30(4), 361–367.
- Chen, J. L., Penhune, V. B., and Zatorre, R. J. (2008). Listening to Musical Rhythms Recruits Motor Regions of the Brain. *Cerebral Cortex*, 18(12), 2844–2854.
- Clark, A. (2008). *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*. Oxford: Oxford University Press.
- Clark, A. (2009). Spreading the Joy? Why the Machinery of Consciousness is

(Probably) Still in the Head. *Mind; a Quarterly Review of Psychology and Philosophy*, 118(472), 963–993.

Clarke, E., DeNora, T., and Vuoskoski, J. (2015). Music, empathy and cultural understanding. *Physics of Life Reviews*, 15, 61–88.

Clarke, E. F. (2005). *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning*. Oxford: Oxford University Press.

Clarke, E. F. (2013). Music, space, and subjectivity. In G. Born (Ed.), *Music, Sound, and Space: Transformations of Public and Private Experience* (pp. 90–110). Cambridge, England: Cambridge University Press.

Clarke, E. F., Dibben, N., and Pitts, S. E. (Eds.). (2010). *Music and Mind in Everyday Life*. Oxford: OUP Oxford.

Cochrane, T. (2008). Expression and extended cognition. *The Journal of Aesthetics and Art Criticism*, 66(4), 329–340.

Colombetti, G., and Krueger, J. (2015). Scaffoldings of the affective mind. *Philosophical Psychology*, 28(8), 1157–1176.

Colombetti, G., and Roberts, T. (2015). Extending the extended mind: the case for extended affectivity. *Philosophical Studies*, 172(5), 1243–1263.

Cupchik, G. C., Phillips, K., and Hill, D. S. (2001). Shared Processes in Spatial Rotation and Musical Permutation. *Brain and Cognition*, 46(3), 373–382.

Cusick, S. G. (2008). Musicology, torture, repair. *Radical Musicology*, 3(1), 1–9.

Cusick, S. G. (2013). Towards an acoustemology of detention in the “global war on terror.” In G. Born (Ed.), *Music, Sound, and Space: Transformations of Public and Private Experience*, pp. 275–291. Cambridge, England: Cambridge University Press.

DeNora, T. (2000). *Music in Everyday Life*. Cambridge: Cambridge University Press.

- Dibben, N., and Haake, A. B. (2013). Music and the construction of space in office-based work settings. In G. Born (Ed.), *Music, Sound and Space*, 151-168.
- Douglas, K. M., and Bilkey, D. K. (2007). Amusia is associated with deficits in spatial processing. *Nature Neuroscience*, *10*(7), 915–921.
- Eitan, Z., and Timmers, R. (2010). Beethoven's last piano sonata and those who follow crocodiles: Cross-domain mappings of auditory pitch in a musical context. *Cognition*, *114*(3), 405–422.
- Elliott, D. J., and Silverman, M. (2015). *Music Matters: A Philosophy of Music Education* (2nd ed.). Oxford; New York: Oxford University Press.
- Elvers, P. (2016). Songs for the Ego: Theorizing Musical Self-Enhancement. *Frontiers in Psychology*, *7*(2), 1–11.
- Eriksson, M. L., Atienza, R., and Pareto, L. (2017). The Sound Bubble: A context-sensitive space in the space. *Organised Sound*, *22*(1), 130–139.
- Frijda, N. H. (1986). *The Emotions*. Cambridge: Cambridge University Press.
- Fritz, T. H., Hardikar, S., Demoucron, M., Niessen, M., Demey, M., Giot, O., Li, Y., Haynes, J.D., Villringer, A., Leman, M. (2013). Musical agency reduces perceived exertion during strenuous physical performance. *Proceedings of the National Academy of Sciences of the United States of America*, *110*(44), 17784–17789.
- Gabrielsson, A. (2011). *Strong Experiences with Music: Music is much more than just Music*. (R. Bradbury, Trans.). Oxford; New York: Oxford University Press.
- Gallagher, S., and Crisafi, A. (2009). Mental Institutions. *Topoi. An International Review of Philosophy*, *28*(1), 45–51.
- Geeves, A., and Sutton, J. (2015). Embodied Cognition, Perception, and Performance in Music. *Empirical Musicology Review*, *9*(3-4), 247–253.

- Goldin-Meadow, S., Nusbaum, H., Kelly, S. D., and Wagner, S. (2001). Explaining math: gesturing lightens the load. *Psychological Science*, *12*(6), 516–522.
- Goldman, A. (1992). The Value of Music. *The Journal of Aesthetics and Art Criticism*, *50*(1), 35–44.
- Grahn, J. A., and Brett, M. (2007). Rhythm and beat perception in motor areas of the brain. *Journal of Cognitive Neuroscience*, *19*(5), 893–906.
- Gross, J. J. (1999). Emotion regulation: Past, present, future. *Cognition and Emotion*, *13*(5), 551–573.
- Gross, J. J. (2015). Emotion Regulation: Current Status and Future Prospects. *Psychological Inquiry*, *26*(1), 1–26.
- Grossman, T. W., Kerr, H. D., and Byrd, J. C. (1996). Hearing loss in former prisoners of war of the Japanese. *Journal of the American Geriatrics Society*, *44*(9), 1089–1092.
- Grüny, C. (2012). The Language of Feeling Made into a Weapon: Music as an Instrument of Torture. In J. A. Carlson and E. Weber (Eds.), *Speaking about Torture*, pp. 205–217. New York: Fordham University Press.
- Herz, R. S., Eliassen, J., Beland, S., and Souza, T. (2004). Neuroimaging evidence for the emotional potency of odor-evoked memory. *Neuropsychologia*, *42*(3), 371–378.
- Iyer, V. (2002). Embodied Mind, Situated Cognition, and Expressive Microtiming in African-American Music. *Music Perception*, *19*(3), 387–414.
- Janata, P., Tomic, S. T., and Haberman, J. M. (2012). Sensorimotor coupling in music and the psychology of the groove. *Journal of Experimental Psychology. General*, *141*(1), 54–75.
- Kersten, L. (2014). Music and Cognitive Extension. *Empirical Musicology Review*,

9(3-4), 193–202.

Kirkpatrick, B. (2013). Regulating the Carceral Soundscape: Media Policy in Prison.

Retrieved September 29, 2016, from

<https://soundstudiesblog.com/2013/06/03/regulating-the-carceral-soundscape-media-policy-in-prison/>

Kivy, P. (1997). *Philosophies of Arts: An Essay in Differences*. Cambridge; New

York: Cambridge University Press.

Koelsch, S. (2014). Brain correlates of music-evoked emotions. *Nature Reviews.*

Neuroscience, 15(3), 170–180.

Koole, S. L., and Veenstra, L. (2015). Does Emotion Regulation Occur Only Inside

People's Heads? Toward a Situated Cognition Analysis of Emotion-Regulatory Dynamics. *Psychological Inquiry*, 26(1), 61–68.

Krueger, J. (2009). Enacting Musical Experience. *Journal of Consciousness Studies*,

16(2-3), 98–123.

Krueger, J. (2011a). Doing things with music. *Phenomenology and the Cognitive*

Sciences, 10(1), 1–22.

Krueger, J. (2011b). Enacting Musical Content. In R. Manzotti (Ed.), *Situated*

Aesthetics: Art Beyond the Skin (pp. 63–85). Exeter: Imprint Academic.

Krueger, J. (2014a). Affordances and the musically extended mind. *Frontiers in*

Psychology, 4(1003), 1–13.

Krueger, J. (2014b). Musical manipulations and the emotionally extended mind.

Empirical Musicology Review, 9(3-4), 208–212.

Krueger, J. (2015a). Musicing, materiality, and the emotional niche. *Action, Criticism,*

and Theory for Music Education, 14(3), 43–62.

Krueger, J. (2015b). The Affective “We”: Self-regulation and Shared Emotions. In T.

Szanto and D. Moran (Eds.), *Phenomenology of Sociality: Discovering the We*.

New York and London: Routledge.

Krueger, J., and Szanto, T. (2016). Extended Emotions. *Philosophy Compass*, 11(12), 863–878.

Laird, J. D. (2007). *Feelings: The perception of self*. Oxford: Oxford University Press.

Launay, J. (2015). Music as a technology for social bonding: Comment on “Music, empathy, and cultural understanding” by E. Clarke et al. *Physics of Life Reviews*, 15, 94–95.

Leman, M., and Maes, P.-J. (2015). The Role of Embodiment in the Perception of Music. *Empirical Musicology Review*, 9(3-4), 236–246.

Loughlin, V. (2012). Sketch this: extended mind and consciousness extension. *Phenomenology and the Cognitive Sciences*, 12(1), 41–50.

Lundqvist, L.-O., Carlsson, F., Hilmersson, P., and Juslin, P. N. (2009). Emotional responses to music: experience, expression, and physiology. *Psychology of Music*, 37(1), 61–90.

Maiese, M. (2011). *Embodiment, Emotion, and Cognition*. New York: Palgrave Macmillan.

Matyja, J. R., and Schiavio, A. (2013). Enactive Music Cognition: Background and Research Themes. *Constructivist Foundations*, 8(3), 351–357.

McDonald, C., and Stewart, L. (2008). Uses and Functions of Music in Congenital Amusia. *Music Perception*, 25(4), 345–355.

Menary, R. (Ed.). (2010). *The Extended Mind*. Cambridge, MA: Bradford Books.

Menin, D., and Schiavio, A. (2012). Rethinking musical affordances. *Avant*, 3(2), 201–215.

Merleau-Ponty, M. (2002). *Phenomenology of Perception*. (C. Smith, Trans.). New

York: Routledge.

Merleau-Ponty, M. (2004). *The World of Perception*. London; New York: Routledge.

Morgan, R. P. (1980). Musical Time/Musical Space. *Critical Inquiry*, 6(3), 527–538.

Nancy, J.-L. (2007). *Listening*. (C. Mandell, Trans.). New York: Fordham University Press.

North, A. C., Sheridan, L. P., and Areni, C. S. (2016). Music Congruity Effects on Product Memory, Perception, and Choice. *Journal of Retailing*, 92(1), 83–95.

Overy, K., and Molnar-Szakacs, I. (2009). Being Together in Time: Musical Experience and the Mirror Neuron System. *Music Perception*, 26(5), 489–504.

Parkinson, B. (1995). *Ideas and Realities of Emotion*. New York: Routledge.

Peisner, D. (2006). Music as torture: War is loud. *Spin*, 92. Retrieved October 16, 2016, from <http://www.spin.com/2006/11/music-torture-war-loud/>

Peltola, H.-R., and Saesma, T. (2014). Spatial and bodily metaphors in narrating the experience of listening to sad music. *Musicae Scientiae*, 18(3), 292–306.

Reddish, P., Fischer, R., and Bulbulia, J. (2013). Let's dance together: synchrony, shared intentionality and cooperation. *PloS One*, 8(8), e71182.

Rentfrow, P. J. (2012). The Role of Music in Everyday Life: Current Directions in the Social Psychology of Music: The Role of Music in Everyday Life. *Social and Personality Psychology Compass*, 6(5), 402–416.

Reybrouck, M. (2015). Music as Environment: An Ecological and Biosemiotic Approach. *Behavioral Sciences*, 5(1), 1–26.

Rice, T. (2016). Sounds inside: prison, prisoners and acoustical agency. *Sound Studies*, 2(1), 6–20.

Risko, E. F., and Gilbert, S. J. (2016). Cognitive Offloading. *Trends in Cognitive Sciences*, 20(9), 676–688.

Roberts, T. (2015). Extending Emotional Consciousness. *Journal of Consciousness Studies*, 22(3-4), 108–128.

Rouget, G. (1985). *Music and Trance: A Theory of the Relation between Music and Possession*. Chicago, IL: University of Chicago Press.

Rowlands, M. (2015). Consciousness Unbound. *Journal of Consciousness Studies*, 22(3-4), 34–51.

Saarikallio, S. (2011). Music as emotional self-regulation throughout adulthood. *Psychology of Music*, 39(3), 307–327.

Sacks, O. (2007). *Musicophilia: Tales of Music and the Brain*. London: Picador.

Saive, A.-L., Royet, J.-P., and Plailly, J. (2014). A review on the neural bases of episodic odor memory: from laboratory-based to autobiographical approaches. *Frontiers in Behavioral Neuroscience*, 8(240), 1–13.

Särkämö, T., Tervaniemi, M., Soinila, S., Autti, T., Silvennoinen, H. M., Laine, M., and Hietanen, M. (2009). Cognitive deficits associated with acquired amusia after stroke: A neuropsychological follow-up study. *Neuropsychologia*, 47(12), 2642–2651.

Schiavio, A., and Høffding, S. (2015). Playing together without communicating? A pre-reflective and enactive account of joint musical performance. *Musicae Scientiae*, 19(4), 366–388.

Schiavio, A., van der Schyff, D., Cespedes-Guevara, J., and Reybrouck, M. (2016). Enacting musical emotions. Sense-making, dynamic systems, and the embodied mind. *Phenomenology and the Cognitive Sciences*, 1–25.

Shapiro, L. A. (2011). *Embodied Cognition*. New York: Routledge.

Skånland, M. S. (2013). Everyday music listening and affect regulation: The role of MP3 players. *International Journal of Qualitative Studies on Health and Well-*

Being, 8(1), 20595.

Slaby, J. (2014). Emotions and the extended mind. In M. Salmela and C. Von Scheve (Eds.), *Collective emotions*, pp. 32–46. Oxford: Oxford University Press.

Slaby, J. (2016). Mind Invasion: Situated Affectivity and the Corporate Life Hack. *Frontiers in Psychology*, 7(266), 1–13.

Tillmann, B., Jolicœur, P., Ishihara, M., Gosselin, N., Bertrand, O., Rossetti, Y., and Peretz, I. (2010). The Amusic Brain: Lost in Music, but Not in Space. *PLoS One*, 5(4), e10173.

Tomkins, S. S. (1984). Affect Theory. In P. Ekman (Ed.), *Emotion in the Human Face*. 2nd edition., pp. 353–395. Cambridge: Cambridge University Press.

Toon, A. (2015). Where is the understanding? *Synthese*, 192(12), 3859–3875.

Turley, L. W., and Milliman, R. E. (2000). Atmospheric Effects on Shopping Behavior: A Review of the Experimental Evidence. *Journal of Business Research*, 49(2), 193–211.

van der Schyff, D., and Schiavio, A. (2017). The Future of Musical Emotions. *Frontiers in Psychology*, 8(988), 1–5.

van der Schyff, D., Schiavio, A., and Elliott, D. J. (2016). Critical ontology for an enactive music pedagogy. *Action, Criticism, and Theory for Music Education*, 15(5), 81–121.

Vermetten, E., and Bremner, J. D. (2003). Olfaction as a traumatic reminder in posttraumatic stress disorder: case reports and review. *The Journal of Clinical Psychiatry*, 64(2), 202–207.

Vold, K. (2015). The Parity Argument for Extended Consciousness. *Journal of Consciousness Studies*, 22(3-4), 16–33.

Wallace, W. T. (1994). Memory for music: Effect of melody on recall of text. *Journal*

of Experimental Psychology. Learning, Memory, and Cognition, 20(6), 1471–1485.

Ward, D. (2012). Enjoying the Spread: Conscious Externalism Reconsidered. *Mind; a Quarterly Review of Psychology and Philosophy*, 121(483), 731–751.

Windsor, W. L., and de Bézenac, C. (2012). Music and affordances. *Musicae Scientiae*, 16(1), 102–120.

Witek, M. A. G., Clarke, E. F., Wallentin, M., Kringelbach, M. L., and Vuust, P. (2014). Syncopation, body-movement and pleasure in groove music. *PloS One*, 9(4), e94446.

Witvliet, C. V., and Vrana, S. R. (1996). The emotional impact of instrumental music on affect ratings, facial EMG, autonomic response, and the startle reflex: Effects of valence and arousal. *Psychophysiology Supplement*, 91, 88–91.

Wynn, M. (2004). Musical Affects and the Life of Faith. *Faith and Philosophy: Journal of the Society of Christian Philosophers*, 21(1), 25–44.