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Martin, Remy ORCID: <https://orcid.org/0009-0001-3473-6249> and Nielsen, Nanette (2024) Enacting Musical Aesthetics: The Embodied Experience of Live Music. Music and Science. ISSN 2059-2043

<http://dx.doi.org/10.1177/20592043231225732>

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# Enacting Musical Aesthetics: The Embodied Experience of Live Music

Remy Martin<sup>1,\*</sup> and Nanette Nielsen<sup>1,\*</sup> 

## Abstract

The vitality and affective potential of the live concert experience is a result of rich, cross-sensory interactions and varied participatory practices. The complexity of such entanglements has recently led philosophers to argue for an enactive, affordance-based approach that interrogates a variety of perceptual and sensory possibilities inherent in aesthetic experiences. Further, Shaun Gallagher's recent addition of the 4As (Affect, Agency, Affordance, Autonomy) to the 4Es (Embodied, Embedded, Enacted, Extended) for clarifying mind–world relations seem to have potent explanatory power for these kinds of encounters. Building on such current philosophical approaches while examining specific (and actual) live musical engagement, this article offers an interpretation of selected audience data from the MusicLab Copenhagen with the Danish String Quartet research concert to discuss particular responses from the audience physically present at the venue. Responding to neuroaesthetic approaches, we clarify the audience members' individual and collective aesthetic experience through an enactive, affordance-based approach. We suggest that what is at play in the live concert environment is a mode of attentive dynamic listening. Rather than seeking to characterize the audience as passively responding to music, a 4Es/4As approach to aesthetic experience seeks to clarify embodied-enactive audience engagement for which anticipation is a dynamic factor that enables further musical action and resonance, also for the musicians on stage.

## Keywords

4E cognition, aesthetic experience, affordances, agency, ecological psychology, enactivism, live concert, musicking, resonance

Submission date: 17 February 2023; Acceptance date: 22 December 2023

The brain is not at the center of a circle with radii of control extending to other elements; it is one component arranged in the circuit, or in what Viktor von Weizsäcker (1986) called a *Gestalt* circle of brain, body, and the (physical, social, cultural) environment.

Shaun Gallagher, 'Decentering the brain' (2018)

The live experience is a real embrace.

Matthew Reason and Anja Mølle Lindelof, Introduction to *Experiencing Liveness in Contemporary Performance* (2016)

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Data Availability Statement included at the end of the article



## Introduction

The aesthetic experience of live music can elicit strong responses in individuals and groups alike. A live concert setting is a musical environment that affords certain experiences, responses, and opportunities for those who participate in the event. “Everyday” musical interactions—now most commonly involving engagement with the virtual ecologies and subjectivities in recorded music—have been seen to have instrumental, or pragmatic value: in this view, music is a resource we can *use* to do and experience different things, much like a tool, or a technology (DeNora, 2000; Krueger, 2014). But the experience of live music sets itself apart from everyday encounters. There are peculiarities to the concert hall experience: it is laden with tradition; with heightened aesthetic expectation; with unspoken rituals and habits, behavioral codes, and rules; and, potentially, with a sense of community, of aesthetic belonging, and self-transformation. Live music settings also have particular resonances of space, place, and time. The vitality and affective potential of the concert experience is a result of rich, cross-sensory interactions and varied participatory practices. That such entanglements are far more complex than can be captured by an instrumental, pragmatic account has recently led scholars to argue for an enactive, affordance-based approach (Burnett & Gallagher, 2020; Noë, 2015). Further, as will be elaborated on in *An Embodied-Enactive Perspective on the Aesthetic Experience of Live Music: From the 4Es to the 4As*, Gallagher’s recent addition of the 4As (Affect, Agency, Affordance, Autonomy) to the 4Es (Embodied, Embedded, Enacted, Extended) for clarifying mind–world relations seem to have potent explanatory power for these kinds of experiences (Gallagher, 2021a). To offer in-depth exploration of affordance dynamics, we also foreground the concepts of resonance and affective framing, arguing that they enable further understanding of the ways audience members make meaningful contact with the live music environment. Ecological psychology and enactivism are, as Catherine Read and Agnes Szokolszky note, “not foes but rather friends, with distinct backgrounds and ideas that take an interest in each other” (Read & Szokolszky, 2020). Some key distinctions and the potential for the coordination of ecological and enactivist perspectives in the study of musical engagement are considered in the discussion.

Building on such recent and current philosophical and psychological approaches while examining specific (and actual) live musical encounters, this article offers an interpretation of selected audience data from the MusicLab Copenhagen with the Danish String Quartet (DSQ) 2021 research concert. In contrast to other contributions to this special collection, here the interpretation of empirical findings informs more general claims for the nature and meanings of live music experience. We assert that audience engagement is characterized by attentive dynamic listening, which shapes spectators’ resonance with, and contribution to, the live performance environment. To describe live spectatorship as dynamic is, first, to

acknowledge the ongoing perceptual shifts and affective modulations that constitute musical consciousness. Second, and more concretely, audience motion data captured at the MusicLab Copenhagen concert unveils vital embodied dynamics. “Stilling moments” (Upham et al., forthcoming) are interpreted here as revealing how individually and collectively audience members actively anticipate—and as illuminated in comments made by the Danish String Quartet, play a part in defining—musical gestures. Thus, rather than viewing audience stillness as an indicator of passivity, we suggest that subtle motional dynamics are important aesthetic enactments. We interrogate whether that which is afforded in such a live setting can be regarded individual, collective, or—indeed—relational without individuals being consciously aware of or without having consciously intended the relation (such as moving—or not moving—collectively). Following a review of recent studies informed by neuroaesthetics, the article will seek to clarify audience members’ individual and collective aesthetic enactments through an affordance-based approach drawing on current work in this area (e.g., Burnett & Gallagher, 2020; Gallagher, 2021a). The ambition is to present a novel, theoretically-nuanced, empirically-informed understanding of the aesthetic experience of live concert events, actual and potential.

## The Aesthetic Experience of Live Music

### *The Neuroaesthetic Paradigm and its Limitations*

What is involved in the aesthetic experience of live music, and how might it be mapped, theoretically and empirically? Adding to a growing number of studies within cognitive psychology that aim for ecological validity, a recent article by Merrill et al. offers a pertinent response by seeking to demonstrate the scientific mileage in moving empirical research outside highly controlled laboratory settings when trying to capture important aspects of the aesthetic experience of music (Merrill et al., 2021). Drawing on sociologist Erving Goffman’s (1974) concept of “frame,” the authors seek to “demonstrate that the ecological validity of the current study is particularly informative for theoretical approaches to the aesthetic experience” (Merrill et al., 2021, p. 1). To engage with the frame is to engage with experience and behavior: as events, objects, and situations are framed, it heightens our capacity to understand, interpret, and evaluate the present experience and behave accordingly. While focusing on “the concert frame,” Merrill et al. argue that the frame components “can be expected to (...) influence aesthetic experience and appreciation” (Merrill et al., 2021, p. 2). The components in the concert frame are many, for example, the programming, the multimodal nature of the event, or a setting which affords a particularly attentive and absorbed mode of listening.

To “measure” and/or “operationalize” the aesthetic experience (Merrill et al., 2021, e.g., p. 3, p. 14), the study focuses on two aspects: music-evoked emotions and absorption. The authors recognize that there can be several dimensions to aesthetic experience, but have chosen to focus on these two due to

their status as aspects that have been previously identified in scholarship within psychology as key for an aesthetic experience of music (Brattico & Pearce, 2013; Brattico et al., 2013). In the experimental design, the study is (commendably) careful to distinguish between perceived and felt emotions: the perceived (expressive) emotion of the music (e.g., “happy,” “sad,” etc.) can potentially be reflected in the felt (evoked, induced, experienced) emotion of the listener, but there is no guarantee that this will necessarily happen. Music may, for example, evoke mixed emotions, such as being moved, and physiological measurements (e.g., of skin conductance, breathing, heart rate, eye blink) may capture induced emotions that transcend the (perceived) emotion of the music, such as pleasure, aesthetic chills, or beauty. Using both self-reports (of music-induced emotions and absorption) and psychophysiology (skin conductance, zygomaticus major (smiling) muscle activity, heart rate, and respiration rate), 98 participants were tested across three identical live concert evenings. Two components of the concert frame were investigated: the programming—where full, whole-movement works were prioritized to ascertain potential effects of musical form—and the “liveness” of the event. While focusing on music-induced emotions and absorption, the main findings of the study relate to how less familiar contemporary compositions can lead to higher negatively valenced emotions in the program order (despite an overall highly appreciated concert), how “liveness” matters for the aesthetic experience as live music elicited higher engagement than recorded music, and how the audience respond differently in levels of tension and relaxation to different styles of music (Classical and Romantic) (Merrill et al., 2021, p. 14).

Accounting for the aesthetic experience of live concerts brings both scholarly opportunity and limitation. While the article acknowledges that aesthetic experience is richer than what can be captured by music-evoked emotion and absorption (Merrill et al., 2021, p. 8), both its title and content arguably constitute a claim to clarifying aesthetic experience broadly through these aspects in particular. Above all, by narrowing the focus to these two components as key to the aesthetic experience (Merrill et al., 2021, p. 8), the study reveals its debt to neuroaesthetics, linking the choice of music-evoked emotions and absorption with key publications within the field (Brattico & Pearce, 2013; Brattico et al., 2013). Merrill et al.’s approach has in common with the neuroaesthetic ambition a focus on music as an expressive art rather than a cognitive domain sharing properties with language, a focus on the potential effect of musical properties (in this case through its discussion of musical form), and—crucially—a wish to create ecologically valid, real-world musical settings so as to simulate examples, in real-world settings, in order to “reliably induce” aesthetic experiences (Brattico & Pearce, 2013, p. 56). Are the ambitions and methods found in neuroaesthetics best placed to account—ecologically—for musical aesthetics? As we will show in this article, both ecological psychology and philosophical enactivism have insights to add that would further deepen scholarly understanding of aesthetic experience.

In summing up the neuroaesthetic ambition, Brattico and Pearce write: “The goal of this emerging field is to understand the neural mechanisms and structures involved in the perceptual, affective, and cognitive processes that generate the three principal aesthetic responses: emotions, judgments, and preference” (Brattico & Pearce, 2013, p. 48). While the ecological ambition of Merrill et al.’s and similar studies reflect some of the aims of the neuroaesthetic paradigm, the proposed approach to musical aesthetics is arguably less ecological than it might have been when accounting for the fullness of musical experience. The critical point here is that had the investigative focus not been pointed to “neural mechanisms and structures,” then the aesthetic responses would not need to have been focused *internally* on the emotions, judgements, and preference generated by perceptual, affective, and cognitive processes. Eric Clarke’s pertinent question “what approach to perception might be fruitful as a basis for aesthetic questions?” is of vital relevance here (Clarke, 2018, p. 264). Instead of an internal orientation toward perceptual, affective, and cognitive processes (neuroaesthetics), an ecological aesthetics would first and foremost orientate itself *externally* and *relationally*:

Perception, then, is about discovering and acting upon the world’s events (Bingham, 2000; Chemero, 2000) and meanings (what is going on and what to do about it), and to listen to music is to engage perceptually with music’s events and meanings (what is going on in this music, and what to do about it). Perceptual principles can account for the ways in which listeners perceive structural processes in music, but in a more far-reaching manner people also listen to the ways in which musical sounds specify the wider world of which they are a part—and the sounds of music specify a huge diversity of objects and events: the instruments and recording media from which they emanate, the musical styles to which they belong, the social functions in which they participate, the emotional states and bodily actions of their performers, the spaces and places in which they are found, the discourses with which they are intertwined. (Clarke, 2018, p. 265)

In recognizing dynamic relations between perception, action, and meaning, the ecological perspective presents a good case for arguing against neurocentric reductionism: if the field of affordances explored through the live concert experience is limited to accounting for the *neural* mechanisms of those perceiving the musical event, important facets of aesthetic experience are neglected because the field of affordances remains too narrow. A live concert experience carries with it a remarkable and recognizable load of aesthetic tradition and perceptual expectation. Within what can broadly be categorized as the Classical music scene, concertgoers entering the concert hall most frequently do so with an awareness that classical works of the Western tradition belong to a recognized canon, that this canon is often couched in terms of “genius” and “autonomy,” and that the performance of works from this canon requires a certain reverence for the composer and the score, an adherence to rules and codes,

allowing only restricted musical manipulation on the part of the performer. If performers are arguably vessels—or agents—for the composer’s musical and aesthetic wishes within the Western Classical tradition, audience members who enter the concert hall can be regarded vessels—or agents—too, willingly carrying the opportunity to become role-players on a collective musical stage couched in aesthetic tradition and perceptual expectation, partaking actively in the ritual of concert attendance. The role-playing involves tasks such as listening, watching, being attentive, being quiet, sitting relatively still, applauding at the right places in the program, trying only to cough when it is suitable, and perhaps even offering a standing ovation at the end of the concert if the performance has been particularly pleasing. These tasks are both fully embodied and socially determined.

### *An Embodied-Enactive Perspective on the Aesthetic Experience of Live Music: From the 4Es to the 4As*

Recent philosophical approaches within “4E cognition” offer arguably a more ecologically-oriented take on aesthetic experience than that proposed by neuroaesthetics. According to proponents of 4E cognition, the mind is embodied, embedded, enacted, and extended. This is an approach which fundamentally recognizes consciousness to be a dynamic part of its surroundings: through various levels of interaction, consciousness is shaped by the body, is embedded within the world, takes form as it enacts itself outwardly, and continually adjusts itself as it extends into the environment. Given this dynamic (externalist) approach, 4E cognition proponents would expand the neuroaesthetic (internalist) aesthetic-response-list of emotions, judgements, and preference, with aspects such as embodied affect or relational awareness as important elements of aesthetic response. The 4E view is flourishing in music cognition (Matyja & Schiavio, 2013) and emotion research (Krueger, 2015) and is informing fresh interdisciplinary perspectives on music creativity (van der Schyff et al., 2018), education (Schiavio & van der Schyff, 2018; van der Schyff et al., 2016), and development (Schiavio et al., 2017). To clarify aspects of the 4E framework and its usefulness for mapping the aesthetic experience of live music, we focus here initially on two Es and interrogate the embodied and enactive dimensions of musical consciousness.

Instead of explaining artistic practices through mapping neurologically-oriented causes and effects, the 4E framework proposes to rethink divisions between “higher” and “lower” cognition, and between culture and biology. As recently stated by Burnett and Gallagher:

If we consider cultural practices and embodied sensory-motor processes, not as higher and lower, but as more fundamentally integrated to begin with, we can shift to a framework where these processes are not modular or distinct, but instead influence and permeate one another. (Burnett & Gallagher, 2020, p. 165)

In their study, Burnett and Gallagher offer an enactive, affordance-based approach to understanding art and

aesthetic experience that focuses on aesthetic possibility rather than purpose:

Rather than making the purpose of art the central question, the question, we suggest, should be about the possibilities that are afforded to a beholder by a work of art. (Burnett & Gallagher, 2020, p. 162)

Continuing the enactive, phenomenologically-grounded 4E approach to aesthetics, then, what possibilities might be *afforded* to a beholder of a live concert experience? While arguing that our reactions to images and artistic representations of people, actions, and objects are different from our reactions to real people, actions, and objects, Gallagher summarizes aesthetic experiences as follows:

Aesthetic experiences offer affordances that short circuit—in a way that comes back to the perceiving agent, disrupting ordinary engagements, and creating possibilities that are not realizable in current or established frameworks. (Gallagher, 2011, p. 109)

A live concert performance is not an artistic representation of people, actions, and objects, but it nevertheless complements Gallagher’s point: in the *artistic situation* of the concert performance, the audience are partaking as embodied agents, disrupted from ordinary engagements, actions, and movements, adjusting to the collective musical experience that is concert going. An aesthetic experience differentiates itself from everyday encounters and suspends our habits of thought. Indeed, it suspends our habits of listening. (This is not to say some other fundamental perceptual mechanisms are engaged or that an alternative model of perception is required; rather, that particular environmental conditions afford particular modes of attention, awareness, and action.) Gallagher draws on Merleau-Ponty’s embodied approach to aesthetic experience, and his account of how art challenges our everyday attitude by revealing something as “strange.” For Merleau-Ponty, listening to music is like entering a different space:

Music is not in visible space, music erodes visible space, surrounds it, and causes it to shift, such that these overdressed listeners—who take on a judgmental air and exchange comments or smirks without noticing that the ground begins to tremble beneath them—are soon like a ship’s crew tossed about on the surface of a stormy sea. (Merleau-Ponty, 2012, as quoted by Gallagher, 2021b, p. 132).

Here, Merleau-Ponty is clearly referring to a concert experience; an experience that is not solitary, and that indeed *is* a different physical space (although its music—as sound—to Merleau-Ponty occupies an invisible space). Continuing the embodied-enactive line of thinking, then, in live experience of music, we are invited both to *act* and *interact* in particular ways, responding to a physical event together with other listening and sensing bodies.

Adding to this, as Gallagher proposes elsewhere (Gallagher, 2011; Gallagher, 2021b), one might consider aesthetic experience as an embodied kinaesthetic event. In this view, aesthetic experience is grounded in movement and our capacity—or incapacity—to perform certain movements. Gallagher (2011) draws on experimental paradigms to show how this capacity can actively shape aesthetic experience, rather than simply be shaped by it, follow it, simulate it, or match it. In one paradigm using eye-tracking (Holšánová, 2006), subjects are shown an image and asked to tell a story about it. The experiment revealed how eye scan patterns of subjects viewing the painting varied in correlation to the different narrative descriptions of the scene:

Where their eyes go, there goes the story. Their viewing is dynamic and enactive—they see the picture in terms of actions—and as they narrate it, they anticipate lines of action that are not depicted; they see possibilities that are only potential in the image itself. Saccades and scan paths anticipate the items mentioned in the narrative—narrative follows the scan paths. Again, the supposition is that kinaesthetic patterns—motor patterns, the activation of the motor system—enactively correlate with the scan paths—not just following them or simulating or matching what is there on the canvas, but anticipating the possible lines of comprehensible narratives. Anticipatory kinaesthesia is not simply the shadow of movement—it can be the foreshadowing of movement. (Gallagher, 2011, p. 108)

Alan Costall's neat formulation of James Gibson's perceptual theory as "an ecology of agency" (Costall, 2007) is useful for understanding the enactivist take on anticipatory kinaesthesia, both in asserting the significance of anticipatory action but also in emphasizing the central role of the body in such action. The basic claim is that our agency in the world rests on our meaningful exploration of it, which involves, crucially, an ability to also "foresee" (Costall, 2007, p. 73) environmental affordances. To foresee affordances does not typically entail us visually "measuring" an object and only then comparing it to our own body. Instead, we experience the object "in relation to ourselves" (Costall, 2007, p. 73). If we play ping pong, for example, our actions are fully relational: as I anticipate hitting the ball with my bat, I do not perceive the ball and my bat-holding hand separately, but in relation to each other. Indeed, in the split second of reacting to the ball approaching, were I to think of the two separately, I would probably miss the shot.

Gibson may have characterized vision as "the queen of the senses" (Gibson, 1966, p. 163), but foreseeing is no less vital to the attentive dynamic *listening* involved in live aesthetic experience and the embodied relations that such experience affords. As suggested by Jacob (2019), attending to sounds and rhythms is fundamentally embodied: "listeners may not be actively aware of their anticipation of sounds but their bodily movements suggest that there is an implicit anticipation of coming notes" (Jacob,

2019, p. 295). Evoking Gallagher (2013) and the idea that temporality is found in all bodily movements and actions, Jacob cements the close connection between embodied self-awareness and temporal awareness: "Thinking about rhythm cannot be thinking about time on the one hand and about the body on the other, as both are intertwined" (Jacob, 2019, p. 305). This intertwining corresponds to the relational aspect of anticipation that we wish to emphasize here: as we listen to and move to music, it is not simply the case that our bodies follow the music but that our bodies are integrated with the musical experience. The relation is dynamic.

The audience motion data presented in Upham et al. (forthcoming) and interpreted in the section below (Discussing a Selection of the MusicLab Copenhagen Findings from an Embodied-Enactive Perspective) reveal forms of collective anticipatory action that shape the experience of the audience and the performers. Research from the MusicLab Copenhagen concert shows that the audience exhibited a "stilling" response, that is, that they suppressed their movement to match points during the concert with a significant decrease in musical activity ("stilling points"), such as an audible rest or a gap in the played sound. As we will show, however, audience members are importantly not merely following the music; rather—as they actively "still" in preparation for these "stilling points" in the music—their experience is shaped by anticipations of what is to come and how this is negotiated. Audience "stilling," we argue, is a noteworthy enactment of embodied agency (Costall, 2007) that informs the rich perceptual experience and meaning of the live concert situation. Because the audience members' engagement with the live concert is fundamentally relational and dynamic, "stilling" becomes an example of the anticipatory dimension of (musical) affordances.

In line with an embodied-enactive conception of action and experience, concert goers are agents encountering stable and unstable environmental elements that they become aware of, attune to, and, in doing so, make sense of. This includes attuning to other agents, whether those agents are fellow audience members or the performers on stage. At this point we suggest that a fuller picture of the aesthetic experience involved can be reached by incorporating Gallagher's 4As into the 4E framework as aspects that are closely interconnected in social interaction: agency, affect, affordance, and autonomy. As Gallagher summarizes:

These are dimensions of human existence that are closely interconnected in social interaction. Affective changes can modulate both my agency and my field of affordances. Agency and affordances may co-vary: e.g., more affordances often mean more possible actions. A decline in agency and constriction of affordances can easily lead to a decline in autonomy. These dimensions are directly at play in intersubjective interactions, which are often emphatically affective, often creative of new affordances, and often constraining or enabling of actions. (Gallagher, 2021a, p. 366)

From an enactive perspective, “affect” involves not only emotion processes but also basic bodily states such as hunger, fatigue, or pain (Gallagher, 2021a, p. 364). In the concert setting, an affective-related aspect such as the comfort of the seating or the heating in the room might plausibly modulate the aesthetic experience of the agent, as the agent becomes distracted or more bodily self-aware (due to comfort or discomfort), leading to a change in the field of affordance, for example, a decrease in musical absorption.

In the physical environment of the concert setting, other agents’ perceived movements—or stillness—might also create new affordances and enable a shared sense of agency. The impact on the aesthetic experience can be both negative and positive, either a distraction or a joint sense of embodied synchrony. Further, as the exploration of “joint attention” in Høffding’s phenomenological framework focusing on expert musicianship has shown, a joint musical experience characterized by embodied attunement need not be conscious to be effective as a shared musical experience (Høffding, 2019, pp. 230–231).

### *Resonance and Affective Framing in the Live Concert*

In foregrounding action and agency, an embodied-enactive approach is well placed to confront the various modalities, vitalities, and perceptual interactions that shape the live music experience. Affordance dynamics are key here, and in this section we argue that the concepts of ecological resonance (Clarke, 2005; Raja, 2019) and affective framing (Maiese, 2014) help further illuminate how perceivers—including through foreseeing environmental potentialities—*enhance* contact with their surroundings. Together, these concepts offer an account of how affect–action relations in particular define musical environments and our experience of them.

It is useful to talk further in terms of resonance, as it is a rich concept that is highly relevant to the various components of the 4Es and 4As framework already discussed and to the broader ecological view argued for here. Raja (2019) provides a very useful summary of its application in several fields and makes strong claims for its foundational role in direct perception and learning. In ecologically-oriented literature, its usage centers on perceivers’ adaptive detection of environmental information (Clarke, 2005; Raja, 2019). This is instructive of the modulating—and *enhancing*—nature of attention, awareness, and action. There is a vital enactive dynamic at play here, wherein the perceivers’ intentional focus toward, and attunement to, environmental variables is always open to readjustment. As Clarke notes, all musical environments—including “virtual” spaces specified in recordings—are “endlessly multiple” (Clarke, 2011, p. 206). The gestures of the musicians, audience interaction, and ambient interruptions such as phone ringtones and passing ambulances, were just a few sources of stimulation in the MusicLab Copenhagen research concert. The ongoing enactive

adaptation to this multiplicity shapes the audience’s immediate experience of it. It is from this environmental attunement that the concert as a meaningful cultural experience, to borrow a phrase from audience scholar Martin Barker, “comes alive” (Barker, 2016, p. 22). Resonance is not, however, based merely on response to our surroundings; rather, it arises from a mutualism that rests on the perceivers’ agential relation to the world. This is not a simple story of causality: the relation is dynamic. Furthermore, in the ecological view, perceiving and acting organisms are never separate from their surroundings and thus do not need to become coupled (Read & Szokolszky, 2020). Resonance is about how perceivers make *further contact* with the environment.

Distinct from notions of resonance that arise from James Gibson’s ecological psychology, Raja also outlines physical—including embodied—understandings that appear in several fields, including cognitive science. These typically concern the oscillatory interactions of two systems (Raja, 2019, p. 408), including forms of “phase locking,” synchronization, and entrainment. The MusicLab audience data offers insight into patterns of bodily (in)activity and synchrony—at times more obviously oscillatory—that can be understood as aesthetic resonances. Attention to embodied, motional dynamics informs a primary claim of this article: it is not just that “the music” makes you move, it is also that movement is a vital dimension of the broader environmental sensing that makes you *music*, regardless of whether the dynamic of the motion is large or small, actual or—as will be explored below in *The Embodied-Enactive Aesthetic Experience of Live Music*—almost absent. In the framework proposed here, Christopher Small’s concept of *musicking* is foundational in that it emphasizes the process of embodied, dynamic *engagement* inherent in our encounter with the art form, be it through performing, sensing, moving, composing, or listening. “To music,” Small writes, “is to take part, in any capacity, in a musical performance, whether by performing, by listening, by rehearsing or practicing, by providing material for performance (what is called composition), or by dancing” (Small, 1998, p. 9). In the section *Discussing a Selection of the MusicLab Copenhagen Findings from an Embodied-Enactive Perspective*, we explore audience coordination as an example of perceptually-guided action and means of resonant (affective) contact.

Resonance is also an important metaphor in the context of musical (inter)subjectivities. Everyday uses of the term in relation to the meaning of aesthetic entanglements are called to mind, notably to describe senses of identification, recognition, and affirmation (“I resonate with this music”; “that piece resonates with me”). This is not reflective sense-making. Rather, to speak in terms of ecological resonance is to acknowledge pre-reflective, embodied-affective forms of perceptual involvement and aesthetic sensing. Nor is this purely personal or “subjective.” The resonant conditions of the concert give rise to shared musical activity and thus also potentially to relational affective outcomes such

as senses of affiliation, social belonging, and collective agency.

Ecological resonance offers a powerful, general account of organism–environment attunement through perceptually-guided action. In her novel conceptualization of “affective framing,” Michelle Maiese provides a rich and seemingly complementary way of understanding emotions more specifically as a means of environmental contact and sense-making (Maiese, 2014). Maiese suggests that affective framing, the ways perceivers engage with and “appraise” their surrounds through bodily feeling, “selectively attunes the animal to its environment” (Maiese, 2014, p. 529). Affective framing, then, not only concerns affective outcomes of interactions within a particular environment (i.e., “I attended a musical performance and I’m pleased I did so”). Maiese’s dynamic, modulatory, embodied conception of affective framing concerns how a particular ecological niche shows up for the perceiver in the first place (i.e., “the activity of musicians on the stage is an especially significant aspect of the musical environment I’m currently sensing”). It is not merely responsive but concerns the affective “apprehension” of our surroundings (Maiese, 2014, p. 518), an idea that hints at the (pre-reflective, embodied) agential foreseeing (Costall, 2007) considered above. Maiese’s sensation-based account of environmental attunement, sense-making, and autopoiesis reveals an explicit allegiance to enactivism rather than a Gibsonian perceptual outlook. Nevertheless, it is important to consider both approaches in the context of their shared emphasis on biological functioning involving continuous adaptation to surroundings (Read & Szokolszky, 2020) through direct forms of perceptual (en)action.

This crucial affect–action relation is captured in relevant ways by other authors adopting ecologically-oriented approaches. While challenging distinctions between emotion and cognition, Erik Rietveld considers the “affective behavior” involved in our appreciation of objects in environments. Being attracted to something (or someone) is an obvious example as it is an appreciation that is both affective and behavioral at the same time (Rietveld, 2008, p. 976). A related musical example is how one can be fascinated by the playing of a particular musician at a certain point in a piece of music, adjusting one’s attention accordingly. The foregrounding of emotion and affect in the accounts of Rietveld and others (Krueger & Colombetti, 2018; Rietveld & Kiverstein, 2014) extends and lends a particular charge to ecological affordance (and, with this, how perceivers establish resonant contact with their surroundings). Affordance is not merely about possibilities for action. Rather, the perceiver experiences environmental affordances as “*potentiating* and having *affective allure*” (Rietveld, 2008, p. 977). In the present article, we argue that forms of motional and affective engagement revealed by the MusicLab Copenhagen data are aesthetic embodied enactments of such a relation. Furthermore, that the musical performance appeals to particular modes of engagement is not merely a result of genre-based behavioral conformity,

but the perceptual apprehension of affective affordances (Hufendiek, 2017) and potentialities.

It is useful, then, to speak in terms of how the live music experience is affectively framed by audience members. In *The 4As and Musiclab Copenhagen: Some Further Considerations*, we acknowledge several affective dimensions of the MusicLab Copenhagen research concert reported in the audience survey data. We refer to these in terms of “affective resonances,” not only in the common sense of their subjective vitality but also in terms of their basis in forms of embodied, perceptual interaction and apprehension within the particular socio-cultural, material, “shared world” (Krueger & Colombetti, 2018, p. 223) of the Musiclab Copenhagen concert.

## Discussing a Selection of the MusicLab Copenhagen Findings from an Embodied-Enactive Perspective

### *The Embodied-Enactive Aesthetic Experience of Live Music*

It is instructive to consider several facets of the MusicLab Copenhagen findings in light of the embodied-enactive perspective that this article offers. Building on Gallagher’s view that aesthetic experience is an embodied kinaesthetic event grounded in movement—and insights from ecological psychology and enactivism into perception, action, and affect relations—it is particularly fruitful to explore the extent to which audience members’ and musicians’ aesthetic experience could be argued to be actively shaped by movement and the capacity (or incapacity) to perform certain movements. After all, as discussed above, it is not just that the music makes you move, but—vitaly—that the movement makes you *music*.

As reported in the “Audience Motion” article of this collection (explored further in *The 4As and Musiclab Copenhagen: Some Further Considerations*), the audience at the MusicLab Copenhagen concert maintained for many pieces (apart from the folk music) “an extreme degree of sustained stillness that felt normal to some and restrained to others” (Upham & Rosas, forthcoming). In the subsequent article on musician- and audience-shared stillness and silence—henceforth “the Stilling Article” — (Upham et al., forthcoming) investigate the dynamics of that stillness and explore the “stilling moments” of the concert, having identified 257 “stilling points” over the course of 84 min of music. Stilling points are moments where there was a significant decrease in musical activity, such as an audible rest, a gap in the played sound, or a decrease in other musical features such as structure, texture, or tempo (see Upham et al. (forthcoming) for a full overview of the selection criteria). Based on both musical and movement analysis, the article argues that “encultured classical music audiences exhibit a ‘stilling’ response to concert music wherein they use their musical



understanding to anticipate moments of stillness or quiet in a performance and cooperatively suppress their own movements to match” (Upham et al., submitted for publication).

It is suggested that stilling involves a “suppression” of movement, but stilling is—we would argue—despite its seemingly restrained form of audience-response, a deeply dynamic, enactive part of musicking. To that extent, it is an activity that does more than just “match” a performance: it actively shapes it and enables action within the performance context. It furthers our meaningful contact with the live environment. The embodied-enactive framework can help clarify how and why this is the case, and why it matters for enhancing scholarly understanding of the aesthetic experience of live music.

At the heart of this claim lies the concept of anticipation, of musical “foreseeing.” An instructive find from the Stilling Article is that, in addition to responding to stiller moments in the music by shifting towards stillness, audience members in fact appear to anticipate points where that stillness might occur, tending toward stillness before it happens musically, becoming still in anticipation (Upham et al., forthcoming):

The sharpness of the decrease and beginning of the plateau suggests that for many of these Stiller points, the audience members were anticipating the onset of stillness rather than reacting to its arrival. A reaction would be expressed as a decrease in motion after time zero, but across these selected moments, the audience members have already adapted to be relatively still with the arrival of the Stilling point. From the timing of these quantity of motion changes, we can infer that audience members are using musical expectations to predict and prepare themselves for cooperative stillness, even if they are unaware of doing so dozens of times per concert.

What is going on here? What do we actually know? From an embodied-enactive perspective, we would seek the answer not through the concept of (reflective) expectation but instead suggest exploring what kind of (pre-reflective) anticipation and apprehension (Maiese, 2014) might be involved. Relating the concert experience closely—almost word by word—to Gallagher’s account of the kinaesthetic, enactive engagement with the painting, the audience’s musicking can be regarded as dynamic and enactive. Audience members experience the music in terms of actions, anticipating acts of stillness yet to happen, anticipating possibilities that are only potential, because the music—as a time-bound art—has not yet happened. Once the plateau, the stillness in the music, has been reached, the potential is confirmed, but the stillness in the audience is already established. As such, the kinaesthetic patterns, the activation of the motor system (to be still), enactively correlate with the attentive musicking, they do not just follow or match the music but anticipate the possible lines of the musical dynamics. It can be claimed that acts of stilling are assertions of audience autonomy and embodied agency (Costall, 2007), a means of audience members

exercising their potential to participate in and define the live musical environment. “Anticipatory kinaesthesia is not simply the shadow of movement—it can be the foreshadowing of movement” (Gallagher, 2011, p. 109). The significance of this can be taken further: foreshadowing can also give rise to a heightened awareness of ownership over the experience of the musical performance, and perhaps even some sense of ownership over the musical performance as it unfolds. Cooperative stilling, then, seems to reveal a vital shared aesthetic resonance: co-presence in a collective enactment of shared musical time.

This dynamic embodied-enactive perspective is supported by how the DSQ while performing on stage are aware of crucial audience engagement in the “stilling moments”: through their extraordinary, and incredibly well-trained attunedness to their surroundings, the musicians respond to the audience stillness, allowing for it to shape their next musical actions. The dynamic response is evident from the way in which members of the DSQ account for those moments of silence (also quoted in the Stilling Article):

Helt konkret så hører man jo at det er stille. Man hører at folk ikke er sådan frem og tilbage på stolen eller begynder med sådan slikpapir eller pastiller, eller programmer man kan sidde og læse i. Man hører om folk sidder stille. For det er en helt særlig stilhed når folk sidder helt stille. Bare den lille, lille, lille oplevelse af tøj i bevægelse, den er nok til at forstyrre den stilhed. – Fredrik Sjölin

You hear—quite concretely—that it is quiet. You hear that people are not, like, back and forth on the chair or fiddling with candy-wrapping or lozenges or with programmes you can sit and read. You hear if people sit quietly. Because it is a very special kind of quiet when people sit completely still. Just the *tiniest* experience of clothes moving, *that* is enough to disturb that stillness. Fredrik Sjölin (Translation by author (NN))

That this awareness involves awareness of the creative possibilities inherent in audience-interaction that emanate from such moments is clear from how the musicians describe a pause as “the most powerful form of gesture,” that pauses can contain an “enormous intensity,” that silence can be “incredibly dramatic.” The DSQ account for those moments as moments in which it is easiest for them to get a sense of the audience engagement and the “energy” shared by both audience and musicians (also quoted in the Stilling Article).

The musicians’ acute attunement to the environment is a well-developed and vital aspect of the concert performance: It is part of the expert training and a musical skill that facilitates the aesthetic experience of both musicians and audience members at a live event. Further, the skill is both a blessing and a curse: when the dynamic works well, the stillness—and stilling—of an audience can foster and enable the musical engagement of the musicians on stage

and positively influence their next musical choice. If it doesn't, audience members can disrupt the musical engagement of the musicians, actively constraining the musical movements that would otherwise lead to a successful performance. For the DSQ concert experiment, the audience's anticipation of the Stilling Moments can be seen as actively enabling the musicians' subsequent musical stillness, as a kind of positive reinforcement of musical moments shared and shaped by both audience and performers. As such, the audience's autonomy, agency, and cooperative engagement have enabled ideal conditions for meaningful aesthetic contact.

### *The 4As and Musiclab Copenhagen: Some Further Considerations*

The stilling data, then, invites acknowledgement of relations between the 4As. Furthermore, it reveals, as Gallagher's insists, that dynamic relations between autonomy, agency, affordance, and agency underpin intersubjective experience and forms of social interaction. There is much to be explored within these interactions as the MusicLab Copenhagen data set offers novel insight into the "mesh" of social consciousness, and how the 4As can be said to "co-vary" (Gallagher, 2021a, p. 366), in a live concert setting.

Two primary, contrasting modes of engagement can be observed. It is useful at this point to return to the audience motion data analyzed by Upham and Rosas (forthcoming). One headline finding is that a majority of audience members reported not being aware of the movements of other audience members during the performances of Beethoven, Bach, and Schnittke. Cooperative action—in the form of stillness, in the main—could, then, be said to be driven by a sense of self-behavior. Upham et al. (forthcoming) offer alternative insight into the autonomy being exercised, exploring awareness of others in the audience in relation to experiences of musical absorption. Attentional engagement with the musical performance, rather than other audience members, is again a general finding. However, reports gathered following the performance of Schnittke's String Quartet No. 3 also point to an important affective relation, hinting that limited awareness of others in the audience may correlate with an increased sense of being "absorbed in the music." How can this be understood as *relational autonomy*? Audience reports reveal vital perceptual, embodied, and affective interactions between individual audience members and the musical performance (and thus performers) situated within a space defined "socially, culturally, and normatively" (Gallagher, 2021a, p. 365).

Motion data evidences a second mode of participation and, with this, a 4As dynamic. The folk music section of the MusicLab Copenhagen concert marked a shift in sound and style that seems to have altered the range of available affordances. Upham and Rosas (forthcoming) observe increased total motion on average during this section of the

concert, with three of the folk music tunes—namely "Stedelil," "Halling efter Haltegutten," and "Halling"—giving rise to "substantially more movement than the rest". With this, it can be said the folk arrangements may afford, at least in terms of motional engagement, an increased (sense of) agency. Sonic-gestural qualities affect this shift. Foot stomping initiated by the performers and homophonic, cyclical musical designs disclose new cultural customs, new ways of reliably acting—of being *entrained*—that carry affective allure (to recall Rietveld & Kiverstein, 2014). That a significant number of audience members sensed that they were moving more than usual for "a concert of this kind" (Upham & Rosas, forthcoming) reveals a sensitivity to agential potentialities within and against expectations in a ("classical") concert setting.

The folk music section also inspired a more active distribution of responses to the movement of other audience members (Upham & Rosas, forthcoming). An expanded scope of attention, then, informs modified (senses of) joint attention, action, and agency; what Simon Høffding, echoing Merleau-Ponty, identifies in musical performance as "we intentionality: a musical intercorporeity" (2019, p. 218).

At this point it is necessary to return to affect. This is not to falsely isolate affect or to render it an "outcome" or consequence of the interaction of affordances, agency, and autonomy. As addressed above, affect is an integrated facet of musical and social interaction. It partly defines our attunement to and apprehension of the particular environment within which we are embedded (Gallagher, 2021a, 2021b; Krueger & Colombetti 2018; Colombetti, 2014; Maiese, 2014; Ratcliffe, 2012). In the context of the live concert, action-affect dynamics drive meaningful contact—*affective resonances*—not only with the activity of the musicians on stage but with other environmental resources and the socio-cultural practices enacted by audience members. When considered together, the concepts of ecological resonance and affective framing offer a powerful explanation for how such contact is established and how it defines the way an environment shows up for us, and help clarify the affective profile of environmental (and, within this, aesthetic) encounters.

Audience stilling can be presented as an example of perceptually-guided action that furthers resonance with the music and musicians. It certainly also points to attentional strategies. But, as Maiese notes, "attention cannot be understood without considering its emotional dimension" (Maiese, 2014, p. 526). The MusicLab Copenhagen data set reveals a rich, complex mesh of affective relations that an embodied-enactive framework helps interpret. It is worth confronting some of these relations here, with reference to other studies prepared for this special collection.

First, affective framing links with anticipation in important ways. When viewed through the lens of affective framing, musical anticipation reveals how audience members attune to their environment by adapting and changing their "bodily-affective style" (Maiese, 2016), that is, their "habitual ways of experiencing, expressing, regulating, and sharing

affective states” (Krueger & Colombetti, 2018, p. 227). The live concert setting affords this anticipatory adaptation in a way that may to some extent be unique to this particular aesthetic niche. Nevertheless, similar embodied adaptation can be observed in other absorbing, time-bound settings, such as when attendees at a football match move to the edge of their seats and hold their breaths in the split seconds before a goal is scored by their team, collectively erupting into a standing roar as the ball crosses the goal line. In such cases, the affective framing afforded by the event—whether it is a concert or a match—is significantly world-disclosive to those who get to appraise the engaging powers of the environment through bodily feelings, sensing directly why and how such encounters can yield such captivating and transformative experiences.

Affective framing can be linked concretely with findings from the MusicLab Copenhagen data set. For instance, Swarbrick, Martin et al. (forthcoming) offer insight into dynamic interactions between affective and attentional dimensions of audience experience. Musical absorption and associated altered states of consciousness are explored in relation to experiences of being “moved/touched” by the music, awareness of physical sensations, attention to other audience members, and senses of being positively or negatively “transformed” by the music. Being “absorbed in the music” was found to be correlated with experiences of being positively transformed, *kama muta*—the feeling of being moved or “touched” that can be accompanied by physiological sensations including tears, chills, warmth in the chest, and/or a lump in the throat (Zickfeld et al., 2019)—and awe, revealing an aesthetic entanglement of engagement and affect that would benefit from further phenomenological scrutiny in future concert research.

Another interesting finding is that “stilling” to key musical moments was related to reports of musical absorption and to senses of connectedness to other audience members (Swarbrick, Martin et al., forthcoming). This finding speaks directly to ecologically-oriented literature on the normativity of (social) engagement with affordances where “what matters for successful coordination with the activities of others is that one can *reliably act in ways that fit in with a sociocultural practice* or cultural custom but also with the *specific details* of the particular situation in which the activity is taking place” (Rietveld & Kiverstein, 2014, p. 333). Stilling can be understood in this instance as affective behavior that informs a profoundly relational appreciation that extends beyond the mere appraisal of the musical performance. The MusicLab Copenhagen concert is a particular ecological niche where bodies that are “being moved”—in both the motional and emotional senses—matter to each other.

## Conclusion

We suggest, then, that what is at play in the live concert setting on the part of the audience is a rich mode of *attentive dynamic listening*. Rather than seeking to characterize the

audience as passively responding to music in a simple causal manner, a 4Es/4As approach to aesthetic experience seeks to clarify the enactive-embodied engagement of a musicking audience for which anticipation is a dynamic factor that enables further musical action, also for the musicians on stage. Put differently, this framework emphasizes embodied interaction and dynamic engagement in the aesthetic experience of live music, leading to an understanding of the attuned resonance—and potential shared senses of agency—between the performers and the audience. All forms of musical engagement (including “private” listening) involve enaction, but the live concert experience forces us to confront a relational setting where the presence and action of others are particularly apparent and formative. That is, where affect–action dynamics in a shared world of affective affordances (Krueger & Colombetti, 2018, p. 242) define aesthetic experience. Further, building on both theoretical and empirical insights, this article contributes to recent 4E discussions by grounding them through the clarification and interpretation of concrete music encounters.

The dynamic push and pull, sensorial and perceptual multiplicity, and sociality of the live music event presents a significant challenge to well-established theoretical perspectives and to the narrower, brain centric analyses that are currently receiving substantial attention in music research. A 4Es and (meshed) 4As framework, we propose, takes us a significant way to accounting for the various, integrated dimensions of musical consciousness in a live context. We position our analysis in relation to neuroaesthetics, arguing that an ecological-enactive approach offers a richer account of the vital perceptual and affective relations that define aesthetic experience. This is not an exercise in finding theoretical “fits” but rather an opportunity to take seriously how the experiential reality of live music experience tests theoretical paradigms. Along the way, the discussion offered here has touched on the usefulness of concepts and perspectives—from enactivism and ecological psychology—that inform and have elsewhere been integrated within a broad 4E outlook. This is not to ignore distinctions that have been explored in recent philosophical discussions (Read & Szokolszky, 2020; Ryan & Gallagher, 2020) but rather to consider their respective and complementary explanatory and phenomenological power. And yet it is not only the case that the empirical informs the theoretical. The MusicLab Copenhagen data collection illuminates such a 4E/4As framework not only as a useful theoretical construction but as an empirical guide that facilitates understanding of the vitalities, interactions, and enactments of musical aesthetics.

## Action Editor

Simon Høffding, University of Southern Denmark, Department of Sports Science and Clinical Biomechanics.

## Peer Review

Joel Krueger, University of Exeter, Sociology, Philosophy, & Anthropology. One anonymous reviewer.

## Contributorship

RM and NN researched literature and conceived the study. Both authors wrote, reviewed, and edited the manuscript and approved the final version of the manuscript.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Ethical Approval

This study was approved by the Norwegian Centre for Research Data (NSD), reference number 915228.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Norges Forskningsråd (grant number 262762).

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## Data Availability Statement

The datasets generated during and/or analyzed during the current study are available in the OSF repository, <https://osf.io/v9wa4/>.

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