

## Towards Extended Music Cognition: Commentary on “Music and Cognitive Extension”

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**ABSTRACT:** In his paper, Luke Kersten (2014) argues that since music cognition is part of a locationally wide computational system, it can be considered as an extended process. Overall I sympathize with Kersten’s (2014) view. However, in the present paper I underline those issues that need to be, in my opinion, developed in a more detailed and cautious way. Extended music perception is the idea that “it ain’t all in the head”, but rather involves the exploitation of non-neural body and musical environment. In order to push the debate further, I suggest situating Kersten’s views within a broader context of recent research, thus strengthening the theoretical importance of his proposal.

Submitted 4 September 2014; accepted 24 November 2014.

**KEYWORDS:** *music perception, extended cognition, music cognition, wide computationalism, musical affordances*

### EXTENDED COGNITION AND MUSIC

THE extended cognition (EC) hypothesis (e.g., Theiner, 2011) was originally formulated by Clark and Chalmers (1998). In the latter paper there is notably no reference to Gibson’s (1966) ideas of non-inferential direct perception, nor the concept of affordances. However, in his classical book *Being There*, Clark (1998) argued for the possibility of linking Gibson’s ecological approach with his representational framework of EC. Similarly, the proponents of embodied music cognition (e.g., Leman, 2008), although sometimes criticized heavily (Schiavio and Menin, 2013), see no problem in linking (musical) affordances with representational frameworks. The guiding idea behind these embodied approaches is, in fact, that music processing “ain’t all in the head”, but rather involves the exploitation of non-neural body and musical environment. Recently, the EC researchers went even further to show that the way we perceive music is, in fact, influenced (in a feed-forward and feed-back manner) by the movements of our bodies (Maes et al., 2014). From this point of view, the very idea of linking an ecological approach to perception with representational frameworks, i.e. the marriage which Kersten (2014) argues for, needs further argumentation for its relevancy going beyond a proposed critique of Krueger’s (2014) account. Much could be gained from acknowledgement of the existing works on extended music cognition (Krueger, 2014). For instance, Tom Cochrane (2008, see also: Cochrane, 2009) has an interesting account of extended music cognition. Cochrane emphasized the role of the artistic medium (musical instrument or the sound produced), claiming that playing the instrument cognitively extends the musicians’ creation of the music. Secondly, he argued that music cognitively extends the musician’s emotional processing. Perhaps a critical account of Cochrane’s theory could help Kersten to underline the importance of his proposal even further.

The following short commentary aims to underline some issues that can help to strengthen Kersten’s account, while also suggesting some interesting literature that would extend these ideas further. Firstly, it would be useful to introduce the hypothesis of Extended Cognition in more detail. It seems that the few sentences in the opening paragraph do not give a reader the full view. Kersten (2014, p. 193) writes:

EXTENDED cognition is the view that cognitive processes sometimes leak into the world (...). A recent trend among proponents of extended cognition is to put pressure on phenomena thought to be safe havens for internalists (...). By arguing that topics like

visual perception or moral cognition no longer mark a clear divided between internalist and externalist views of the mind, proponents of extended cognition seek to “loosen the screws on the individualist skullcap (...).

A number of questions arise from this paragraph. For instance, when does cognition – in a musical context – leak into the world? When does it not? What are the theoretical (and perhaps practical or environmental) constraints for counting an instance of an agent’s perception of music as an extended cognitive process? However interesting, these are obviously the “big” questions (for a detailed discussion and possible ways of accounting for them see Walter (2013)). However, accounting for them would possibly interest researchers (potentially) interested in embodied approaches to music cognition. Situating Kersten’s account within the context of debates on extended cognition in general (e.g., Menary, 2012) would underline the importance of scrutinizing music perception from these perspectives.

### COMPUTATIONALISM AND AFFORDANCES

Kersten begins his article by making a case for an extended (or wide computationalist) view of music perception. He thus briefly refers to the internalist / externalist debates in philosophy of mind. As a proponent of extended cognition, he takes a middle ground which suggests that “some phenomena strain externalist explanations because what’s inside the head is often supplemented by what’s outside” (Kersten, 2014, 193). It would be useful, for illustrative reasons, for the author to provide a particular example of the situation. Otherwise, one might find the claim that the “extended view can sometimes offer an explanatorily superior account” (Kersten, 2014, p.193) provoking. For instance, Kersten criticized Newell and Simon for limiting their analyses of perception to “internal operations”. However, Milkowski (2014, p. 14) notes that these two scholars allowed sensorimotor processing to be seen as parallel to “in-the-head” processing (Newell and Simon, 1972, p. 89) yet given the scientific spirit of the times, perhaps, did not account for it. In that sense, Walter (2013, p. 1) underlines the fact that although empirically plausible at the time, it was never argued that we necessarily must view cognition as “brain-bound”. Apart from the partial accounts on the internalist / externalist debates that one may find in the literature on enactive music cognition (Matyja and Schiavio, 2013), I had not come across any serious discussion of internalist / externalist accounts in terms of musical processing. For instance, in an earlier paper Krueger (2009) argued against a “clear divide” between internalism and externalism in music perception, but the big question is what we can learn from taking a more extended cognition-influenced approach on these (internalist / externalist) debates. Without the reference to current literature, Kersten’s argument that there is a *need* for music cognition to reflect representational (rather than enactive) views on cognition seems rather “out of the blue”. Accordingly, it would be helpful to define the term *representation* in a musical context (e.g., Nussbaum, 2007; Nudds and O’Callaghan, 2009), while acknowledging also the alternative anti-representational accounts (Menin and Schiavio, 2011). For instance, Marc Leman’s (e.g. 2008) work on embodied representations may be of use here. In his account, Leman draws upon both upon the concepts of affordances and embodied representations (for a critical review see Schiavio and Menin, 2013). There are currently many theories and critiques of the latter (see, for instance, Masataka, 2010; Tanaka et al., 2011; Menin and Schiavio, 2012; Reybrouck, 2012; Windsor and de Bézenac, 2012). It would be interesting to see how the application of extended cognition to music cognition affects our understanding of the concept of musical affordances.

It is also puzzling that Kersten seems to criticize Krueger’s (2014) approach for being “sympathetic” with what he calls “dynamic views of cognition“ (p. 7). In light of recent works (Kaplan & Bechtel, 2011) on mechanistic explanation in cognitive science (that attempt to bridge computational views and dynamic systems approaches), I do not understand Kersten’s argument. On the one hand, he suggests that computationalism and dynamic approaches are in contrast. On the other, he seems to suggest (but not argue for the claim) that there is in fact no great tension between them. Accordingly, the literature on mechanistic explanations may be helpful for clarifying those issues. Mechanistic explanations often tend to suggest a complementarity between mechanistic decomposition of information-processing and Chemero’s dynamic systems-based account that, in turn, puts pressure on the assumption that there is a problem with leaning towards a dynamic view. This issue is further puzzling because, in the opening paragraph of his paper, Kersten announces a marriage between an ecological theory of perception and wide computationalism. A noteworthy feature of Gibsonian work is the recognition of the dynamics between the environment and cognizing agent which motivates current ecological theories of music (e.g. Clarke, 2005).

The clear (and argumentative) discussion of the division between the cognitivist (e.g., Pearce & Rohrmeier, 2012) and dynamic approaches to music perception (Borgo, 2007) perhaps using a mechanistic explanation approach as suggested above. For now, it remains rather unclear to me how Kersten thinks about (the lack of) link between those two.

In a similar vein, I am not entirely convinced by Kersten's (2014) statement that "an extended view of music perception begins to reorient our attention to the acoustic array and its musical invariants" (p. 198). On the contrary, I believe that a large body of research in ecological psychoacoustics (e.g., Neuhoff, 2004) has already reoriented our attention before his paper, and did so without any appeal to any extended views. Moreover, it has already influenced various researchers working on the embodied and enactive approaches to music cognition. Kersten's suggestion for the need for "common frameworks" in cognitive sciences of music is really exciting and worth developing further. Kersten (2014, p. 200) writes:

At some point views of extended music cognition may have to come to terms with each other and adopt a common framework. However, given the relative youth of combining music studies with 3E cognition, it seems safe to say that the study of music cognition can pursue both approaches. Like so much like of cognitive science the proof may be in the pudding. Whether either framework is more profitable depends on the research that comes out of it. For now, there seems ample room for both approaches.

This idea is certainly compatible with a growing field of literature on explanatory pluralism in cognitive science (e.g., McCauley & Bechtel, 2001; Dale et al., 2009; Gervais, 2014; Marshall, 2014). Explanatory pluralism, roughly speaking, is the idea that – in contrast to theoretical reductionism or eliminativism – acknowledges the multiplicity of explanations. The guiding idea here is that simultaneous pursuit of research at multiple analytical levels tends to aid progress at each of those levels. The reference to these ideas could help extend Kersten's discussion of the relevancy of his proposal on extended music perception. For now, I believe that his paper is a nice springboard for further work in this research area.

### ACKNOWLEDGEMENTS

I am indebted to Kevin Ryan for comments on early drafts. I would also like to acknowledge that my involvement with this project was financed by the resources of the National Science Centre (NCN), granted under decision number DEC-2011/03/N/HS1/01703.

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