

Reply to comments

Transitional zones of meaning and semantics in music and language

Reply to comments on “Towards a neural basis of processing musical semantics”

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I thank all commentators for their contribution to this discussion on musical semantics, and I am grateful for their insightful, resourceful, and thought-provoking comments. Just reading the titles of their comments illustrates how interesting and multifarious this field is. While reading the comments, it became clear to me that, with certain specifications and clarifications, the conceptual framework of musical meaning and musical semantics provided in my article is useful and valid. It also becomes clear that, while there are differences in the semantic organization of music and language, there is agreement on the view that there is also huge overlap with regard to the cognitive processes, and the neural operations, underlying processing of meaning information in music and language. Here, I will respond to a few issues that appeared across several comments, rather than responding separately to each commentator.

1. The music–language continuum

In his commentary, Kreutz [1] mentions the difficulty to define music, which is mainly due to the huge inter-, and often intra-cultural diversity of music. Instead of offering different definitions of “language” and “music”, I have previously suggested [2] that language and music are different aspects of the same continuum (the music–language continuum), rather than being two strictly separate domains. In the following, I will illustrate this with regard to meaning and propositional semantics.

2. Meaning of music vs. meaning arising from the interpretation of musical information

It is important to differentiate the “meaning of music” (in the sense of “how does a musical *system* work with regard to its capability of conveying meaning information”), and the processes underlying the emergence of meaning due to the interpretation of musical information by a perceiver of music. The former deals with music and its meaning as an *object*, the latter deals with the *subjective* processes related to the interpretation of musical information (and the interpretation of psychological and physiological effects of music perception) that give rise to meaning. My neurobiological theory of musical meaning tries to consider both sides: The “meaning of music” as a system, and the

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psychological reality that musical information means something for an individual. It goes without saying that there is a certain correspondence between both sides, although there is a gradient of correspondence (some signifiers are more precise, or ambiguous, than others), in music as well as in language. That is, although “a word, standing alone, typically has a rich denotative meaning that [...] musical fragments lack” (Fitch and Gingras [3]), musical information can also have a clear denotative meaning, particularly with regard to symbolic (extra-musical) meaning, and the specificity of the meaning of words has been questioned reasonably by philosophers such as Wittgenstein [4] (see also below).

The differences between musical and linguistic meaning raised by Slevc and Patel [5], by Fitch and Gingras [3], and in part by Reich [6], mainly deal with the “meaning of music” (and it seems that Slevc and Patel [5] mainly refer to Western music). In this regard, I find their points about differences between the musical system underlying, for example, absolute tonal music on the one hand, and language on the other, valid.

However, with regard to the point that “the meaning evoked by music is far less specific than meaning evoked by language” (Slevc and Patel [5]), one should bear in mind that the use of language faces the problem that sensations (“Empfindungen”, such as sensori-interoceptive information, action tendencies, or background-feelings) have to be reconfigured into words, and we may doubt the inter-individual correspondence of such sensations even if the same word is used to refer to these sensations (see, e.g., Wittgenstein’s private language argument).¹ My hypothesis is that music can evoke sensations which, *before* they are reconfigured into words, bear greater inter-individual correspondence than the words that an individual uses to describe these sensations. In this sense, music has the advantage of defining a sensation *without* this definition being distorted by the use of words (think of Mahler’s quote that, “if a composer could say what he had to say in words, he would not bother trying to say it in music”). In music (particularly in Western music), we are often dealing with a description (not with a verification), and with certainty (not with knowledge). With regard to propositional semantics and binary (true–false) truth conditions, this also means that there is no “true” or “false” with regard to the inner application of a rule for the usage of a concept.

In other words, one should keep in mind that, although music seems in terms of its semantic specificity “far less specific”, music can be more specific when it conveys information about sensations that are problematic to express with words because music can operate *prior* to the reconfiguration of sensations into words. Note that, in spoken language, affective prosody operates in part on this level, because it elicits sensational processes in a perceiver that bear resemblance to those that occur in the producer.

3. Communication vs. expression

Slevc and Patel mention that “linguistic, but not musical, semantics exists for communicative reasons”, and that “instrumental music might better be conceived of as a form of *expression* rather than of *communication*”. Apart from the fact, that this depends on how music is used in a particular culture (see also comments by Cross [7] and Seifert [11]), I would like to note that the two terms “communication” (in the sense of conveying specific, unambiguous information) and “expression” (in the sense of conveying rather unspecific, ambiguous information) are normally used as if there were two separate realms of conveying meaningful information (communication and expression) with a clear border between them. However, as already outlined above, I do not believe that this is the case, and my position is that there is a continuum of the degree of specificity of meaning information, with “expression” being located towards one end, and “communication” towards the other.

4. What is meant with musical semantics?

As mentioned above, I regard language and music as different aspects of a continuum (the music–language continuum), rather than being two strictly separate domains. Propositional constructions represent one pole of the continuum, and I agree with Reich [6], Fitch and Gingras [3], as well as with Slevc and Patel [5] that precise use of propositional codes “cannot be found in any musical tradition” (Reich [6]) unless music imitates language.

The interesting phenomenon here is, in my view, that we appreciate music as communicative medium, *even though* there are no operators such as quantifiers, modals, or connectives. Cross [7] offers one interesting hypothesis with

¹ I adopted the term “reconfiguration” for the reconfiguration of sensations into language from Gunter Gebauer (personal communication).

regard to musical meaning: in music, due to relational goals that involve “the formation, maintenance or restructuring of connections and affiliations between participants, [...] meanings are not required to be made mutually explicit.” An additional hypothesis is that, in the sense of a music–language continuum, the degrees of freedom differ between language and music with regard to the construction of propositions (as well as the ambiguity of meaning). In reality, there is a transitional zone between “propositional” and “non-propositional”; for example, instrumental music can evoke associations to concepts such as “some” and “all”, and modifiers, modals, or connectives are often used imprecisely in everyday language (think of the logical and, or the logical or). However, anyone interested in how listening to music with propositional semantics might feel like, just has to listen to a song.

With regard to the term “musical semantics”, I use this term to emphasize that processing of musical meaning goes beyond the mere processing of musical signs (as outlined in the target article). I do not use this term to refer to the use of quantifiers, modals, or connectives, or binary truth-conditions, and therefore the use of the term “musical semantics” should not simply be equated with the use of the term semantics in linguistics.

5. Distinction between intra- and extra-musical

Davies [8] doubts that the distinction between extra- and intra-musical meaning is precise; I believe that this distinction is precise, and that the notion of impreciseness is grounded on misunderstandings: *Firstly*, “intra-musical” is not necessarily related to repetition (on the contrary: usually, it is not). For example, an irregular chord function within a harmonic sequence, or the resolution of a structural breach, is not due to repetition (and happening on a relatively small time scale, often within several seconds). *Secondly*, “intra-musical” refers to structural (e.g., syntactic) relations. Therefore, musical meaning emerging from quoting musical information (that is, of one piece referencing to another musical piece) is a special case of *iconic meaning* (the musical information resembles that of another musical piece). That is, although musical information is referencing to musical information (seemingly intra-musical), one (previous) musical piece X becomes an object outside the present structural context of piece Y, and Y references in an iconic way to X. *Thirdly*, if a composer “alludes to an archaic style”, this is a symbolic sign quality (not an indexical one), because the musical style is symbolic for a certain period or style. That is, although musical information is again referencing to musical information (seemingly intra-musical), a musical style X becomes an object outside the present structural context of piece Y, and Y references in a symbolic way to X. *Fourthly*, it should be kept in mind that several musical meaning dimensions might be processed in parallel (for details see the target article, see also comment by Cross [7]). Therefore, for example, an irregular chord in a musical passage with an archaic style might give rise to meaning with regard to both intra-musical structural relations and symbolic (extra-musical) sign quality.

6. Extra-musical: More than trivial

Slevc and Patel [5] note that “music does not obviously activate extra-musical meaning any more than various other types of non-linguistic stimuli do, such as environmental sounds”. This is, by definition, not the case for indexical and symbolic extra-musical meaning. With regard to iconic extra-musical meaning, this is not the case unless environmental sounds are intentionally used as a means of communication by an individual. The study by Steinbeis and Koelsch [9] showed that musical signals produced by an individual are interpreted by a listener in terms of the intention of the producer to communicate something with the music. This differentiates the meaning emerging from music on the one hand from the meaning emerging from environmental sounds on the other.

7. N400 & N5

In her commentary, Besson, Frey and Aramaki [10] raise the possibility that the N400 also reflects intra-musical meaning (as indicated by N400 effects elicited by musical targets primed by musical stimuli): This is a valid point, which requires future investigation. One could argue that both musical prime and target sounds evoke representations of (extra-musical) meaningful concepts, but this remains to be specified. Besson et al. [10] also mention the possibility that the N5 is, in fact, a delayed N400; again, this is a valid point that needs further investigation. At the moment, it does not seem appropriate to consider the N5 as a late N4, due to its more frontal scalp distribution, and because the N5 is more tonic than the typical N4. However, I find the idea that the N5 consists of several sub-components quite plausible, and in some cases one of these sub-components might be a late N400.

8. Social aspects of musical meaning

The comments of both Seifert [11] and Cross [7] emphasize that musical meaning is grounded in social interaction, an important point with which I entirely agree. Therefore, I would like to emphasize that my framework on musical meanings is *not* grounded on a “specifically *western* conceptualization of what constitutes music” (Cross [7]). In particular, considering the concepts of symbolic and musicogenic meaning aims at incorporating cultural phenomena in which “music is embedded in the fabric of everyday lives” (Cross [7]). For example, we [12] have studied music perception in the Mafa people in Northern Cameroon, who have different pieces of instrumental music, each being tightly associated with a certain ritual. Therefore, although void of any iconic or indexical meaning, each song has a clear symbolic meaning. With regard to musicogenic meaning, I have emphasized that, especially during music making in a group, communicating and understanding intentions, and as well inter-individual coordination of movements and actions is a pre-requisite for cooperation; these social functions (to which Cross [7] refers to in part as “relational” in terms of “involving the formation, maintenance or restructuring of connections and affiliations between participants”) are part of what makes us human, and engaging in these social functions has meaning for the individual (for a more detailed account of these social functions see [13]).

The participatory, and therefore social, nature of music, affording us to experience coordination, cooperation, group cohesion, spirituality, and the feeling to belong, represents another realm of the music–language continuum, which, as Cross [7] puts it, “might best be thought of not as an autonomous realm but as a mode of human communication that is homologous with aspects of linguistic interaction”.

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