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The Contribution of Semiotics to Knowledge Organization for music information

Abstract
The primary goal of knowledge organization (KO) is to determine which concepts should be considered as representing a field of knowledge. From a Semiotic point of view, different kinds of music meaning (being genuinely a concept or not) correspond to ways in which music is understood by listeners, how they communicate about music, and consequently, the conceptual universe of music domain. The present study discusses the particularities of interpretant levels, which for Peirce are: emotional (feelings and emotions), energetic (particular experiences) and logical (convention). Emphasizing the emotional level, the discussion highlights four theoretical implications for music information KO: 1) The levels of meaning and the use of music information are parameters that need to be observed when mapping the field of music; 2) Concepts in the field of music should be analysed from the perspective of the semiosis process, as it is not possible to operate with isolated elements; 3) Emotional concepts in the field of music do not follow linguistic conventions; 4) The function of objects in forming emotional concepts is not to adjust meaning to reality. We conclude that it is now more essential than ever to return to concepts constructed from an unconventional perspective in order to analyse music KO. As the semiotic approach holds the necessary flexibility to connect music-related concepts, the non-expert user's participation is fundamental on uncovering music domain.

1. Introduction
The primary goal of knowledge organization (KO) is to determine which concepts should be considered as representing a field of knowledge (Smiraglia 2014, 26). For that, the central point of knowledge analysis and the development of conceptual relationships is that of conventional verbal language. However, in the field of music information, words that refer to different levels of meaning are frequently used by those in search of information, as it can be seen from several online music websites.

Allison-Cassin (2016) highlights the importance of considering elements that she calls "music scenes" for describing music, including rehearsal and performance spaces, production methods and music consumption. For her, the characterisation of music scenes introduces contextual metadata that should be taken into account in bibliographic descriptions of music, with "contrasting data structures focused on the idea of 'work' versus models that attempt to recognize the 'assemblage-like reality of music in an everyday context'" (Allison-Cassin 2016, 182). Fuller et al. (2016) used a large study group to test the efficiency of seven different types of persona (hypothetical archetypes of user behaviour) in classifying user profiles, with the goal of better directing music services. User behaviour on listening has also an impact on other meaning possibilities that include social perceptions of music (Selfridge-Field 2006; 1

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1 For example: Musicovery, Last.fm, Spotify, Superplayer, among others.
Laplante and Downie 2006; Laplante 2010, 2011), usage recommendations (Hu, Downie and Ehmann 2006), and emotional scopes (Hu and Downie 2007; Liebman, Stone and White 2015; Pesek et al. 2014). The structural characteristics of music may even hold a different relevance depending on whether users are interested in listening to music or in producing it (Andersen and Knees 2016).

From a Semiotic point of view, all these music-related elements correspond to ways in which music is understood by listeners, the meaning it evokes, and consequently, the conceptual universe of music domain. This is a pragmatic view, once the meaning of signs (being concepts or not) are known throughout its functions in the real world, i.e., practical phenomenological experiences, no matter if they are “true” or “false” in relation to reality.

This paper presents the Peircean Semiotics as a theoretical framework for music information domain representation. According to Peirce, the semiosis process is based on three correlates: sign, object and interpretant. The present study emphasizes the interpretant levels, which for Peirce (CP\(^2\) 5.475, CP 5.476) are: emotional (feelings and emotions), energetic (particular experiences) and logical (convention). The objective of this study is to discuss the specificity of concepts resulting from each level of meaning, emphasizing the emotional level. After that, we present four theoretical contributions based on the Peircean Semiotics for knowledge organization for music information.

2. Levels of meaning

Within Peircean semiotics, the logical interpretant is based on social conventions, holding more stability than the other two levels. This kind of interpretation is a result of a deliberate analysis of the sign, similar to a logical structure of an argument. If a piece of music is in the "major A tune", it will always carry this characteristic, regardless of the way that users relate to this information, once this interpretation is a kind of a logical result of the analysis of music features and its relation according to previous rules. However, if users have an awareness of musical keys, they are likely to notice the "major A" key. The fact that music stimulates feelings of joy, sadness, celebration etc. does not alter the meaning, which is a general concept built on convention (Peirce 1995). The energetic interpretant in turn, is connected with the physical consequences that music causes as meaning effects, such as music to listen in the gym, or even the way emotion transcends itself and triggers physical responses such as crying, singing, dancing, etc.

On the emotional and energetic level, music has no rules as to how it should be felt, or should be interpreted (Cumming 2000). From this perspective, there is a theoretical gap in the field of KO that underlies the specificity of music related concepts. Concepts

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2 The initial CP refers to the work "Collected Papers of Charles Sanders Peirce", and the following numbers refer to volume and paragraph, respectively.
from each level of sign interpretation have particular characteristics concerning the object-interpretant relation, and the extent of meaning sharing. On KO literature, it is possible to find some definitions of what is a concept, which vary depending on theoretical background. According to Dahlberg (1978) a concept is a set of true statements about an object. Therefore, it implies a dichotomy regarding the “true/false” relation, in which not all possible meanings could be considered. For Thellefsen (2004), a field must be analysed on its epistemological principles, functioning as a structure for developing a “knowledge profile”. That knowledge profile allows concept recognition, its analytical definition and relations. Thellefsen’s approach seems to be fruitful for scientific fields, in that its actors use theoretical bases, share objectives and research traditions. According to Hjørland (2007, 2) “concepts are the meaning behind words” and “one concept expresses one meaning”. In fact, all concepts are representations, but not all representations are concepts, as it could be a sensation, an image, a movement, etc. However, people need to communicate through concepts, and those meanings that are not genuinely concepts need to be “translated” into words. There is a distance between feeling an emotion or a physical sensation and naming it verbally. That is because some phenomenological experiences cannot be captured by linguistics terms. So, it is necessary a kind of adaptation of the words to express emotions, in this case “the meaning behind words” is a different kind of concept.

According to Savan (1981), emotion is composed of ill-defined feelings and sensations without clear identities, which makes them confused, yet similar. This is the location of the emotional interpretant, where the mind rehearses the understanding of the meaning and allows one to name emotions. Think, for example, of trying to analytically explain the elements that constitute the feeling of "joy": this feeling is not the result of a logical conclusion regarding the perception of a phenomenon (as it would occur in the analysis of a logical argument); rather, it is a hypothesis that this set of elements that come to mind should be called "joy". Savan (1981) calls this type of interpretant a "simplifying hypothesis", one which constitutes what the author calls “emotional concept”.

When music is used for recreational purposes, playing the role of sign, from the listeners’ points of view, emotional levels and personal experiences play a clearer role, revealing distinct concepts from those genuinely logic.

3. Methods

This paper is part of a wider study on knowledge organization for music information that has been developed along two main lines: one on theoretical semiotics, and the other one on applied semiotics. Barros, Café and Laplante (2016) presented some of the results of the applied study that involved interviews with young adults. The authors introduced music as a sign, and focussing on interpretants' emotional level, discussed the objects the music represents and its implications for KO.
We are now presenting results of the theoretical study based on Peirce’s works and his commentators. The focus relies on “concept construction”, as it is through this that knowledge and information organization processes are constituted.

4. Results

We propose four theoretical contributions to music information KO, distributed over two main lines, as follows:

1. The general constitution of music domain from a KO perspective
   1.1 The levels of meaning and the use of music information are parameters that need to be observed when mapping the field of music.
   1.2 Concepts in the field of music should be analysed from the perspective of the semiosis process, as it is not possible to operate with isolated elements.

According to Peirce (CP 5.475), sign interpretation can occur only at the emotional level, or evolve to the energetic or logical level. The evolution of one level to another is related to, among other conditions, the intensity of the emotion felt, the recurrent validation of particular experiences at an energetic level and convention at a logical level. For example, the likelihood that a defined and more intense emotion (e.g. “excitement”) can evolve to an energetic interpretant (e.g. “feeling like dancing”) is greater than that of a less intense feeling (e.g. “a good song”). Thus, certain relations start to arise between meaning levels and, consequently, between concepts that constitute these levels, creating a framework for music domain representation.

Emotions and particular experiences evoke non-referential concepts, i.e., it is not the features of “excitement” itself that are represented in a given song, it is the emotion felt by the user that is projected onto the song. This is to say that expressions such as "music to study" or "music to work out " go beyond mapping users’ informational behaviour and become potential terms to represent the field with conceptual relations to emotions, musical structures, etc. In this sense, analysing signs, objects or interpretants in isolation does not provide sufficient references for concept analysis.

Within interpretant levels, specific categories of terms can be inductively constructed based on users’ experiences and intensity indication (i.e., through tags, descriptions, “likes”) increasing the reliability of domain representation. For example, in constructing ontologies used by tag recommendation systems such as those in Font et al. (2014) and Font, Serrà and Serra (2015), meaning levels can operate as a principle for tag-based classification, in which the user could give more information to enrich semantically his or her classification choice. This method can be extended to different meanings, as for example, music genre definition: when a song is tagged as "samba" and "jazz" one could point in an intensity scale "how much samba or jazz is the song".

2. The nature of emotional concept construction

2.1 Emotional concepts in the field of music do not follow linguistic conventions.
2.2 The function of objects in forming emotional concepts is not to adjust meaning to reality.

Emotional concepts seem to be those that are least discussed in the field of knowledge organization, precisely because of their elusive character. Information Science refocuses on the universe of verbal language and more specifically, written language, which uses conventionalised symbolisation. This means that the bibliographic universe is influential in maintaining the current paradigm of KO (Smiraglia 2014). In the case of music, when viewed outside of its scientific field, it is more difficult to understand which elements are actually regularly shared between individuals, and we can see this in Abrahamsen's definition (2003) of the field of music as being everything and anything that may be connected with it.

Emotional meanings, communicated through emotional concepts (Savan, 1981), are central to the conceptual representation of the music field, more so for non-expert listeners. Moreover, due to the nature of the objects they represent and the iconic character of music signs per se, the logical and conventional conjecture that determines these concepts remains incomplete. Convention is the result of a previously established rule of significance. It involves a degree of generality, capable of maintaining the meaning provided, and associated with the concept in different situations (CP 2.292). Emotional concepts do not have previously established meanings, as what constitutes the interpretant in this case is not convention, but rather, the circumstances that suggest interpretations of the object’s emanation in the sign. There is always a hint or possibility of assigning meaning. For example, while an Eric Clapton song can be always understood as such, thanks to the generalised conventional idea of “authorship”, we cannot expect that the same will occur with a “happy song”. On an emotional level, the same song could be understood as “happy” and “sad” at the same time, and this is not necessarily a contradiction. The object represented by a certain song can be different in each semiosis, and it is different from scientific concepts which need to be adjusted by the sign’s object to better represent it.

According to Cumming (2010) it is important to avoid expressions such as “X is a sign of Y”, in the sense that a musical sign interpretation must preserve the possibility for other suggestions. So, it is preferable to say that "certain characteristics of Y can be heard in X". In other words, we will not find an assertive answer about what are the characteristics of a certain emotion that also occurs in a given song. This dynamicity is intrinsic in music and, for KO purposes, it needs to be maintained in the domain representation throughout user’s constant contributions.
5. Conclusion

From a pragmatic point of view, we highlight the value of a semiotic theory that goes beyond the analysis of verbal language conventions, and considers the semiosis process to explain the music information domain. Anyway, theoretical deepening and analytical refinement is still needed for possibly developing methodological guides for music KO purposes. As the semiotic approach holds the necessary flexibility to connect music-related concepts, the non-expert user's participation is fundamental on uncovering music domain.

Further investigations will be developed from information retrieval perspective. On one hand, terms used in music description should not be the same as those used in music retrieval. On the other hand, terms that may not be used for music retrieval can be relevant for music description, giving clues to the user to make music choices and to improve automatic recommendation systems.

References


