

**Deborah Lee, Department of Information Studies, University College
London**

Form as classification: an exploration of musical form as a knowledge organization system

Abstract

KO has a significant and intriguing relationship with domain knowledge. This paper proposes that a structure which is central to the domain of music could be considered to be a type of KOS: musical form. Musical form is the term used to describe the organization and structure of a musical work, and this paper will focus on musical form within Western art music.

First, the study will consider how KOSs are defined, and will use definitions of KOSs from sources by Mazzocchi (2018), Zeng (2008) and Hodge (2000), to draw out eight possible criteria by which something can be considered to be a KOS. Then, the paper will determine how musical form relates to these criteria, utilizing the example of sonata form for illustration. The discussion opens up intriguing debates about the nature of music information, including the interrelationships between music practice, music retrieval and musical form. Valuable questions arise about the nature of KOSs more generally, such as whether KOSs can be non-textual. Importantly, the analysis of musical form highlights the vital temporal element of musical-form-as-a-KOS, and asks whether we can perceive a KOS which describes the organization of material within a temporal, as opposed to a primarily spatial, plane. The paper culminates in a model of musical-form-as-a-KOS and commentary on its potential position in KOSs of KOSs.

This paper offers a useful addition to music KO discourse and introduces a novel approach to the study of KOSs. Musical form is a relatively undiscussed area of musical classification, especially in comparison to genre. Furthermore, the findings could potentially be applied to form in other domains too, such as literature. Ultimately, this paper serves to expand our understanding of exactly what is a KOS.

1.0 Introduction

KO has a significant and intriguing relationship with domain knowledge, and the domain analytical approach has been a significant strand of KO discourse (for instance, see Hjørland 2008). This paper proposes that a type of information which is central to the domain of music can be considered to be a KOS: musical form. Musical form refers to the organization and structure of a musical work, and the discussion in the music domain is usually about specific exemplars of form such as sonata form, rondo, fugue, theme and variations, and so on. These individual types of forms could be viewed in a radical new way: if a form is a structure which organizes music information, then can form be considered a system of knowledge organization, albeit one acting in atypical ways?

This paper explores this intriguing question, using a mixture of literary and conceptual analysis. First, the study considers how KOSs are defined, and uses a synthesis of writings about KOSs to produce a framework through which to examine musical form. Eight criteria are extracted which are elemental to being a KOS, and these will be used to determine whether, and in what ways, musical form acts as a KOS. The paper culminates in a model of musical-form-as-a-KOS and commentary on

musical form's potential position in KOSs of KOSs. Ultimately, this exploration of musical form offers a novel contribution to the study of KOSs, in addition to discussing a relatively undiscussed part of music classification: considering musical form in this way asks fundamental questions about what it means to be a KOS.

2.0 Introducing musical form

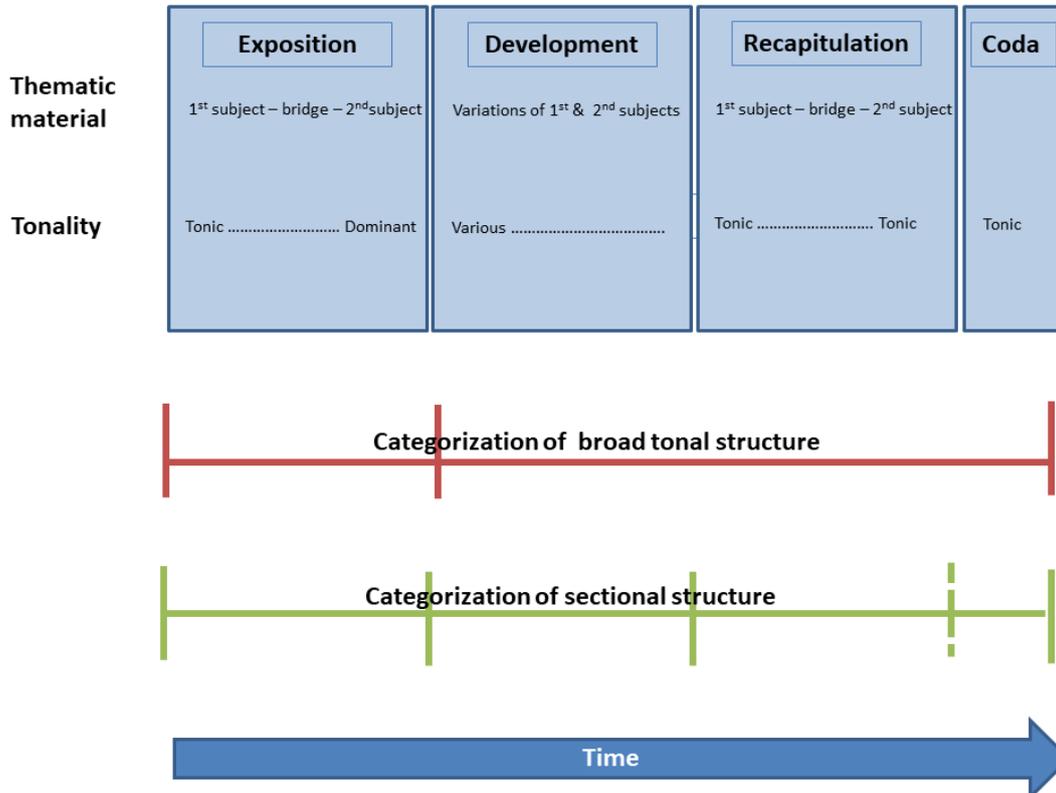
Whittall (2001) defines musical form as “the constructive or organizing element in music”. This can be split into two ideas: the idea of form as something which helps build music, and the idea of form as something which organizes. The latter is of particular importance to the subject of this paper, which positions form as an organizing system. In addition, some musical definitions discuss form as a plan or design (for example, in foundational musical form textbooks by Prout (1893) and Cole (1969)), to which there are potential parallels with knowledge organization systems. Although structural features are an important part of many different musics, the term “form” and its history are perhaps particularly associated with Western art music. So, this paper will focus on musical form from the Western art music viewpoint, with the understanding that the general principles could be applicable to a much wider variety of different musical styles and cultures. Note, that what is being discussed in this paper is musical form rather than musical genre. While in KO literature about musical classification the terms “form” and “genre” are often interchanged – see for example how Elliker (1994) entitles this type of information “form/genre” and Lee’s (2017) discussion about the terminology used for form and genre in bibliographic classification schemes – in this paper, we are exclusively talking about form rather than genre. This means we are discussing the structural principles, rather than connections to conventions, style or musical medium.

Music theory writings suggest that there are certain common types of musical forms. Examples of these include sonata form, binary form, minuet, fugue, theme and variations, and scherzo. This paper is proposing that any *one* of these named types is a KOS in its own right. To engender useful discussion, this paper will utilize one specific example of a form: the sonata form. The sonata form is a highly significant musical form, employed prolifically from the mid-18th century through to the early 20th century (Webster 2001). The sonata form is described as having three main sections, which are the exposition, development and recapitulation, with a possible coda at the end of the work (Webster 2001).¹ Within the exposition and recapitulation, there are the “first group” and “second group”, which refers to groups of musical ideas and includes a so-called first subject/theme and second subject/theme (Webster 2001), and these subjects/themes are separated from each other by the “bridge” (Newman 1972). The exposition follows a specific tonality which sees the music move from the tonic key in the first group to typically the dominant key in the second group – where tonic and dominant are two relative harmonic positions within the tonal universe of the specific musical work; conversely, in the recapitulation, the first group is once again in the tonic key, whereas the second group now appears in the tonic rather than the dominant. The development section contains thematic material from the exposition, usually exploring a variety of tonalities (Webster 2001, Leichtentritt 1951).

¹ Note that the division of the sonata form into sections and the names of these sections has engendered debate and discussion in musical discourse, but are outside of the remit of this paper.

Interestingly, Webster (2001) suggests an implicit tension between different types of information within the sonata form: the sonata form is described as having “three main sections, embedded in a two-part tonal structure” and being “a synthesis of the tonal structure, the sectional and cadential organization and the ordering and development of the musical ideas” (Webster 2001). The form of the sonata form is depicted in a simplified manner in Figure 1. It shows the three main sections (plus coda) as well as their constituent thematic and tonal makeup. The figure also overlays Webster’s (2001) broad categorization of the sonata form into three sections but two tonal parts, and this serves to emphasize the different types of musical information which appear in this example of a musical form.

Figure 1: A simplified depiction of the sonata form, showing categories of thematic material and tonality



3.0 The criteria of being a KOS

The idea of a knowledge organization system (KOS) is more a broad category of things, rather than a single idea. Mazzocchi (2018), in their encyclopedia article about KOSs, starts by saying that the term "... is a generic term used for referring to a wide range of items ... which have been conceived with respect to different purposes, in distinct historical moments". In fact Mazzocchi (2018) also says that there are so many types of KOSs that they ask if KOSs even have any shared characteristics at all. Therefore, it is unsurprising that there does not seem to be a single, widely-accepted set of characteristics or criteria of a KOS, despite much writing about different types of KOSs. So, to overcome this, in this paper three sources which discuss KOSs generally are synthesized and interpreted to yield criteria about the essence of KOSs.

The first source is a quote from Mazzocchi (2018): "... the term KOS is mostly used to refer to functional items designed for organizing knowledge and information, and making their management and retrieval easier they are basically made of

terms/concepts ...” (Mazzocchi 2018). This (Mazzocchi 2018) yields four key ideas about KOSs: they are functional; they organize knowledge/information; their purpose is to manage and retrieve information; KOSs consist of concepts, which appear as terms within the KOS. The second source is an article by Zeng (2008). This presents two axes for delineating and describing different KOSs, based on structure (moving from flat to multiple dimensions) and on function (listing five specific functions of KOSs). We can see here how function appears in both the quote from Mazzocchi (2018) and in Zeng’s (2008) model, and that function of a KOS appears to be both a binary characteristic (functional versus non-functional) and a set of function types. The third source is Hodge’s (2000) seminal article about knowledge organization systems for digital libraries. Two extracts from this are useful for generating criteria of being a KOS. In the opening section, Hodge (2000, 3) defines the purpose of a KOS, stating that “Knowledge organization systems are used to organize materials for the purpose of retrieval and to manage a collection”, an idea also picked up by Mazzocchi (2018). Then, Hodge (2000) gives three characteristics of KOSs: they represent one single cultural perspective; different KOSs could organize the same concept in different ways; there needs to be a connection between the concepts in the KOS and how they appear in the real world. The first two are utilized in our criteria. (The third is not explored as it relies on the candidate KOS having concepts, an idea which is not straightforward for musical form and is discussed in Section 4.3.)

So, these criteria can be synthesized. Where different sources discuss similar ideas, these have been captured in the same criterion. Furthermore, an extra criterion has been added concerning language, which was implicit in parts of the three sources. The eight criteria are as follows:

1. Organizes knowledge and information
2. Aids the management and retrieval of information
3. Contains terms and concepts
4. Communicates by written language
5. Has functions
6. Has dimensions
7. Represents a view of the world
8. Can treat the same concept differently from another KOS

The list has been ordered into three crude sections. The first criterion is arguably the most important, and discusses general principles of knowledge organization (as opposed to knowledge organization *systems*). The next tranche (2-6) concern the constitution of the potential KOS and its uses. The last two (7-8) criteria consider how the potential KOS sits in the world, both in its cultural perspective and in the relationships between one KOS and another. So, now musical form is discussed in conjunction with each of these criteria in turn, to respond to the question about musical form as a potential KOS.

4.0 Applying KOS criteria to musical form

4.1 Organizes knowledge and information

One of the most significant features of a KOS is that it organizes information and knowledge. Note that this criterion could be considered to be more about knowledge

organization itself rather than the resulting KOS. Although a seemingly simple question, asking whether musical form organizes musical information and knowledge asks deeper questions about what exactly is musical information and/or knowledge, and what it means to organize it.

The primal question is whether musical form can be considered to group and order information. We can use the example of the sonata form here. Its three or four sections could be considered to be a set of categories: exposition, development, recapitulation, and coda. Each musical note, musical phrase, and section of music lives in one of these categories, and so the category of exposition could be considered as a way of grouping musical material. It is pertinent to ask how the whole (the sonata form) is divided into these groups, so the potential characteristics of division of sonata form. One perspective is to think of the grouping as being by function: for example, the exposition presents the thematic materials for the first time, while the coda ends the musical work. Another perspective is to consider the grouping as being by specific features of musical composition, such as harmonic structure and thematic material.² In fact, Webster's (2001) definition of sonata form suggests three possible characteristics based on intrinsic musical qualities: the movement of the harmony over a large scale; the division into sections, which appears to be based on musical time and harmonic movement over a small duration; and the thematic material, including the melodies.

Ordering of groups is a key aspect of knowledge organization, and this is particularly interesting for musical form. On one hand, the groups of music information have a very distinct order within sonata form: exposition is followed by development, which is followed by recapitulation, and so on. However, this asks a question about whether groups are defined by this order, and if so, whether this has an impact on form's candidature for being a KOS. For example, the exposition and recapitulation offer an interesting response to this: by definition, a recapitulation has to happen after an exposition, showing the importance of order. This idea of temporal placement is sometimes discussed in the music domain; for example, Caplin (2009) suggests that the exposition and coda, which they call "formal functions", are indebted to time. In the sonata form, an exposition and a recapitulation have tonal differences. This means that while the recapitulation always happens after the exposition, if you just played a recapitulation by itself it would still be different from the corresponding exposition. Nevertheless, the sonata form example illuminates one of the most fascinating aspects of musical form's interpretation of organizing knowledge, which is that it is at least partially based on the position of that knowledge in time.

Contemplating musical form as organizing information also brings up another important issue: the mode of delivery of this information. Not only is music believed by many writers to be something which exists as sound (for example, Jacob's (1973) dictionary definition of music which describes music as "arranging sounds"), but some theorists (for example, Cole 1969) also state that musical form can only exist if it can be heard. So, this suggests that a musical form as a KOS would be a KOS made of sound rather than any type of notation. This is an extremely important point, and

² Interestingly, Caplin (2009) hints at characteristics of division when discussing forms being notated by a series of Latin alphabet letters (e.g. A, B, A'). Here, each letter represents a collection of thematic material, and the use of this notation shows how the same thematic content appears at different junctures within the musical work

potentially challenges some of our perceptions about KOSs. (A discussion about language occurs in Section 4.4.)

The final question asks who is doing the organizing of knowledge and information in musical form. The two most likely contenders are the composers who create the musical works – leaving aside performer-created works for now – and the theorists who analyze the musical works. In other words, is the organization by creator or analyzer? Whittall (2001) says that intensive discussions about form are in the realm of pedagogical works teaching composition, rather than being for analysts. Furthermore, offering a historical perspective, Pauer (1878) suggests that forms reproduce what is in the mind of the composer, which implies that forms are created by composers. So, we could say that musical form as a KOS is encoded within the compositions and is the creation of the composer, yet is also at least partially realized by those writing about musical form for various reasons, including pedagogical ones.³

4.2 Aids the management and retrieval of information

Musical form could be considered a way of making the management of the music information easier. If a musical form is a way of dividing a musical work into sections, then this could be construed as helping to manage the musical information within that work, due to its assignation of various chunks of music to one part of the structure or another.

Considering musical form as information retrieval opens up some intriguing questions. At its broadest, information retrieval is the process used to “...selectively recall recorded information from a file of data” (Reitz 2020). Translated to a single musical form, information retrieval could be considered as the process by which specific chunks of the musical work are recalled from within the musical work. Musical form does in some instances help with this recall, especially for learning purposes. For example, when learning a musical work for the first time, musical form could be used to recall specific sections of that work, such as a pianist using the form to locate the recapitulation of a piano sonata for practice; for instance, a pianist might use the form of a sonata to help memorize it, which helps to retrieve the right muscle memory and mental memory when performing. So, while not an obvious case of information retrieval, there are some situations where musical form could be said to aid in musical information retrieval, especially in relation to learning music.

4.3 Contains terms and concepts

A KOS is defined as being made up of terms and concepts (Mazzocchini 2018), yet a musical form is made up of sections of music rather than subjects. (The divisions between concepts, terms, subjects, and so on, are outside the remit of this paper.) While some musical forms (or form/genres) have an identifiable subject – for example, tone poems have specific narratives or subjects, and nocturnes are about the night – we cannot argue that even these musical forms would be constituted by those subjects. However, “concept” implies an idea and an abstraction, so it could be argued that when we break down sonata form into “exposition”, “recapitulation” and so on, then “exposition” could be considered to be a concept. The exposition is, after all, an

³ The categorization systems used to organize different types of musical forms is a fascinating subject, but it is outside the remit of this paper.

abstraction of the actual sequences and collections of musical notes in any specific musical composition.

4.4 Communicates by written language

A KOS consisting of language is an idea implied by Mazzocchi (2018) and is also necessary for many of Zeng's (2008) KOS functions. Conversely, musical form is something which exists as musical communication: it is a structure which resides in time and is ultimately not language. However, even musical forms are mediated by the use of language. The sonata form is described using words (e.g. exposition, recapitulation, etc.) or else by letters which denote different sections (e.g. A, B, etc.), and these terms or letters constitute the musical form/KOS. So at a basic level, a musical form is depicted using language. Nevertheless, the function of language in a musical form is different from other KOSs. If the musical form is the aural information laid out in time, then "exposition" and "A" are merely notations, and thus a musical form cannot be said to consist of language. Furthermore, musical form could not be said to be *about* language, in that it does not engage with vocabulary control and similar endeavours used in Zeng's (2008) delineation of KOSs.

Nevertheless, this discussion opens up an intriguing idea: musical form shows how KOSs could be considered to act in more modes of communication than just textual notation. To some extent, this is already true. It can be argued that even traditional library classification schemes also use visual, non-textual information, such as Library of Congress's (2021) use of indentation to represent hierarchies; moreover, some important KOSs are primarily represented through visual information, such as the Periodic Table. So, there is an argument that KOSs already embrace more modes of communication than language alone, and in this respect, considering musical sound (/notation) as the communication mode of a KOS is merely an extension of an idea already implicit in KOSs.

4.5 Has functions

Mazzocchi states that a KOS has to be a functional item. Musical forms are functional: their purpose is to describe the structure of the musical work, which in turn has purposes including informing the audience of where they are up to in the composition, providing tension and contrast, and a myriad of other things. However, KO literature (Ojennus and Tennis 2013a, 2013b, Lee 2015) suggests that a KOS can have other, non-functional qualities too, based around aesthetics. This means that musical form's combination of functional *and* aesthetic qualities certainly does not preclude it from being a KOS.

Zeng (2008) outlines five specific functions of KOSs: "eliminating ambiguity", "controlling synonyms", "establishing relationships: hierarchical", "establishing relationships: associative" and "presenting properties" (Zeng 2008). It is interesting to note whether and how musical form performs these functions. Musical form cannot be said to have any relevance to "eliminating ambiguity" or "controlling synonyms" (Zeng 2008), as musical form is not about language. The fifth function is concerned with presenting properties such as those found in ontologies, and musical form does not appear to have a meaningful equivalent.

The third and fourth functions (Zeng 2008) are concerned with relationships, and here the possible applications to musical form emerge. It could be argued that there are whole-part hierarchical relationships contained within some musical forms. The sonata form has sections such as the exposition, and these have traditional subsections such as Group 1 and Group 2. Group 1 is part of the exposition, and so is in a whole-part relationship with the exposition. Furthermore, the exposition Group 1, the exposition bridge and the exposition Group 2 together constitute the exposition in a way which is both exhaustive and mutually exclusive. This fulfils the criteria needed to be considered a hierarchical relationship. It is particularly interesting to note that it is a hierarchical relationship laid out in a temporal, aural plane.

The associative relationship offers some intriguing possibilities too. For example, in the sonata form, the exposition and recapitulation share similar thematic material and internal structures, in a way which is neither synonymous nor hierarchical. This is similar for all other types of form which contain repetitions of thematic material. Therefore, we could argue – however obliquely – that the sonata form is establishing an associative relationship between two groups of musical notes which it labels the exposition and the recapitulation.

So, two of Zeng's (2008) five listed functions of KOSs appear to be fulfilled by musical form – albeit in a different interpretation than what is perhaps usually seen. However, in Zeng (2008), the functions are mostly cumulative, meaning that if a KOS has the third function it also has the second function. (Synonym rings appear to offer an exception to this, in having the second function but not the first.) Yet musical form has only the third and fourth functions. This leaves us with a question about whether this means that there are types of KOSs which fall outside of Zeng's (2008) model and so indicate that this figure is ripe for expansion, or whether instead it dilutes musical form's case for being a KOS.

4.6 Has dimensions

Musical form has a strong association with time. First, those defining musical form define it as something which only exists as sound, and sound has to take place in a temporal plane as it involves durations and aural experiences which unfold over time. Second, the categories within a musical form are arguably partly defined by where they appear in time. A section's position in time such as the exposition within the sonata form is arguably part of the organizational structure of that form. Webster (2001) is explicit about form being structure within a temporal frame: "Like any form in tonal music, a sonata-form movement creates its designs in time" (Webster 2001).

Time is also arguably a dimension. So, this temporal frame can be fitted into Zeng's (2008) model of KOSs, if we are willing to extend and adapt it. Zeng's (2008) model has a y-axis for structure/dimensions, and categorizes structures of KOSs as "flat", "two dimensions" or "multiple dimensions". In this model, for example, a term list is considered flat, an authority file has two dimensions, while thesauri and ontologies have multiple dimensions (Zeng 2008). Therefore, we could consider a temporal frame to be a logical extension to this dimensions y-axis by adding an additional category for the fourth dimension of time. This temporal dimension of the structure of KOSs would be for organization structures which unfold over time, providing the perfect home for

musical form.⁴ Ultimately, considering musical form as a KOS also questions what a KOS can be, by introducing the idea of a KOS which organizes information in a temporal frame.

4.7 Represents a view on the world

The last two criteria of KOSs harness a different type of property of a KOS. Hodge (2000) says that a KOS will always represent a particular view of the world; so, the KOS is encased within the perspective of its authors. Again, musical form offers an equivalent to this idea. Different examples of musical structures are associated with different genres of music; a sonata is associated with Western art music, rather than with folk music or reggae.⁵ Consequently, the view of the Western art music world is enmeshed with the organizational structure of the sonata form. The categories in the sonata form are applicable to a Western art music world – for example, the idea of returning thematic music and the tonic tonality may not have meaning in some other types of musical context. Therefore, it can be said that musical form offers a particular view on the world, like other KOSs.

4.8 Can treat the same concept differently from another KOS

Hodge (2000) states that different KOSs could treat the same concept in different ways. In a form such as sonata form, it would mean that part of a musical work that might be considered to be the first group of the exposition in a sonata form (one KOS), could be considered to be the trio in a minuet (another KOS). While there are many reasons why this is unlikely to happen, it is theoretically possible. Therefore, musical form does meet this criterion of being a KOS.

5.0 Conclusion

This exploration of musical form as a type of KOS has revealed how musical forms in many ways act as KOSs. A musical form can be said to be performing KO, as it both groups and orders musical information. Interestingly, musical form shows an almost heightened sense of order; ordering of the groups partially defines those groups, an act which is not typical in other types of KOS such as the classification scheme or thesaurus. We can take this further: much of musical form depends on the relationship between those groups of musical information. For example, the recapitulation is defined by the exposition. This study has revealed that musical form has some of the properties of a KOS, and performs some of the same functions, but not all. For instance, we can say the musical form has the potential to help with the retrieval and management of music information, and also displays hierarchical and associative relationships between ideas – albeit not always exactly in the ways intended by traditional definitions of KOSs. Musical forms similarly have some of the same limitations of KOSs: they are limited to one view of the world, and each form could offer a different categorization for the same group of musical notes. However, where

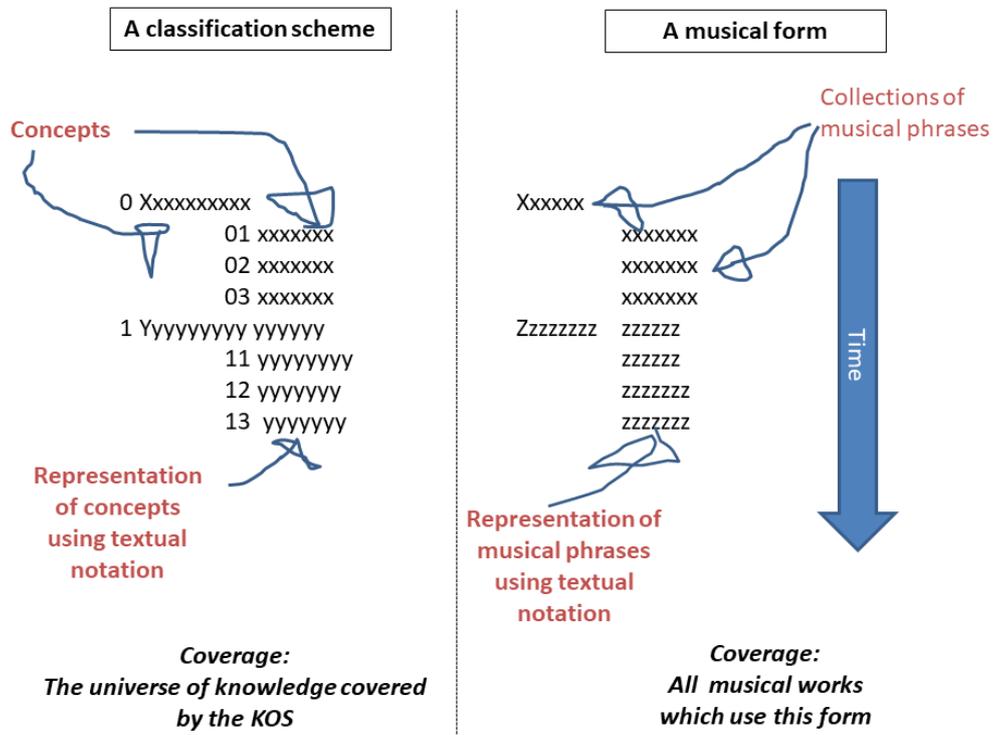
⁴ Of course, the temporal plane in classification is already part of KO discourse (for example, Tennis 2010, 2013). However, the temporal dimension which is outlined here refers to when time is part of the KO structure itself.

⁵ Interestingly, even the concept of musical form could be seen as linked to Western art music. Structure may be important to other types of music, but might not be labelled as “form”.

musical form really does not fall within the realm of KOSs is around concepts and language. A musical form can be represented by textual notation, but is not born of it; musical notes are not concepts in the way that traditional KOSs demand.

One of the most significant ideas to emerge from this examination is related to the temporal aspects of musical form. This positioning of musical form as a KOS within a temporal plane offers something both contained within theories of KOSs – as a further dimension in Zeng’s (2008) model – whilst simultaneously expanding our conception of KOSs. Figure 2 models the musical form as though it were a KOS, showing some of the similarities and differences between musical-form-as-KOS and an example of a traditional KOS, namely a classification scheme. From Figure 2, we can understand how musical form seems to group and organize things, and how it is like a KOS but is not exactly a KOS.

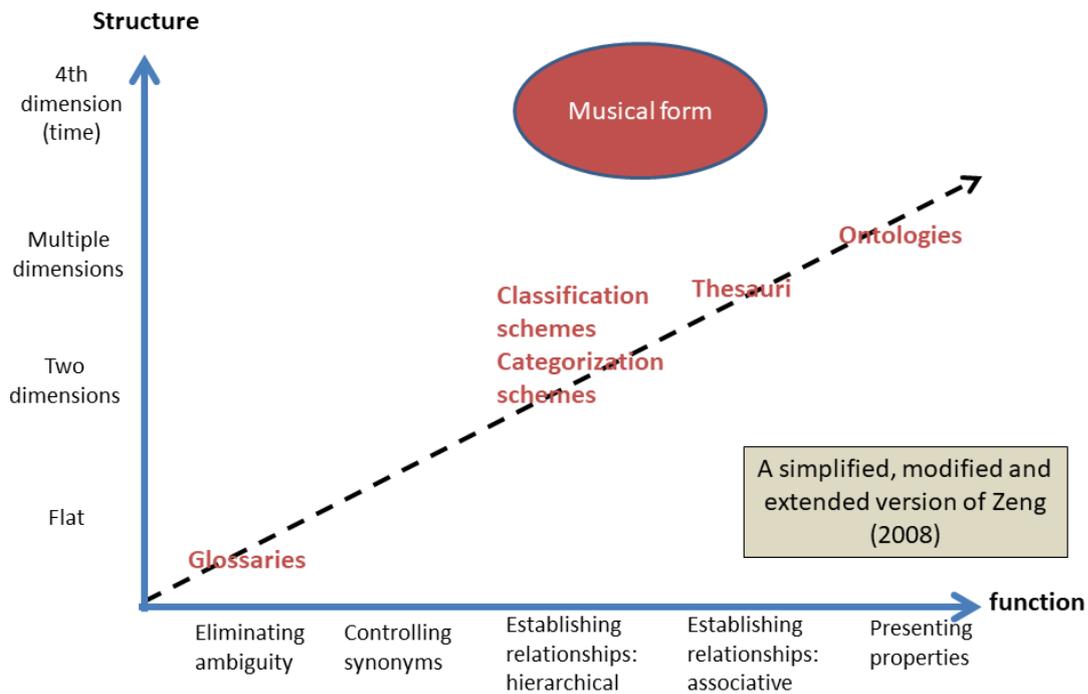
Figure 2: A musical form depicted as a classification scheme



If musical form is considered to be a KOS, it is interesting to consider where it would fit into various delineations of KOSs – or, the KOSs of KOSs – as mapping KOSs is a prolific research question within KO (for example, see the important network of KOSs by Souza *et al.* (2012)). It is useful in this case to utilize a system already discussed in this paper: Zeng’s (2008) two axes for delineating KOSs. In this

model, the x-axis is for function and the y-axis represents structure (dimensions). The positioning and categorising of musical-form-as-a-KOS is presented in Figure 3. This figure simplifies Zeng (2008) including only retaining a few of the example KOSs, changes some of the visualization, and then adds musical form to the model. The placement of musical form on the y-axis requires an extension to this axis in order to accommodate a higher dimension relating to time, thus musical form is represented by a high value on the y-axis. The placement of musical form on the x-axis is interesting. As discussed in Section 4.5, musical form has only a few of the functions of KOSs, and these do not follow the mostly cumulative pattern set by the other KOSs in Zeng's (2008) model. Furthermore, as musical form has some associative relationships but is not defined by them, musical form has been situated somewhere between the classification schemes/categorization schemes and thesauri on the x-axis. So, in Figure 3, musical form sits far above Zeng's (2008) dotted line for function/structure combination; what this means, is that musical form's structure is more advanced than its functions, due to its position as a KOS within time. Therefore, this analysis of a KOS of KOSs shows that musical form is in the realm of KOSs, but also occupies a unique position within it.

Figure 3: Extending Zeng (2008) for musical form



Two important ideas emerge about KOSs more generally from this contemplation of musical-form-as-a-KOS. First, this study considers a potential KOS which is associated with a non-textual mode of communication, namely music. This has the potential to expand what is considered to be a KOS, and links with other non-textual aspects of KOSs such as visual elements of classification schemes. Second, the importance of the temporal dimension to KOSs is highlighted by considering musical form in this way. So, KOSs do not just have a temporal dimension which emerges when considering their creation, usage, updates and criticism (see works by Tennis 2010, 2013, Lee 2015), this study shows that a KOS can also be a creature of time. Examining musical form introduces the idea that a KOS can exist as a temporal – rather than textual – entity. This concept is intriguing and would benefit from further explanation and development in future research.

Considering musical form as a KOS has been an interesting exercise, with some novel findings around KOSs and some thoughts about further research. This paper has shown a different way of thinking about musical form, which could be interesting to those contemplating musical form within the music domain. Importantly, there is also potential to expand this research to consider whether formal structures in other arts could be contemplated in the same way, such as in literature or theatrical works. This would not only extend our understanding of KOSs, but could also potentially find links between the knowledge organizations of different topics and domains. This study has shown how musical form shares many features with KOSs, yet takes the KOS to alternative and augmented spaces. Ultimately, musical form may or may not be a KOS; nonetheless, considering this question helps us to contemplate and comprehend the concept of the KOS itself.

References

- Caplin, William E. 2009. "What are Formal Functions?" In William E. Caplin, James Hepokoski, James Webster, *Musical Form, Forms & Formenlehre: Three Methodological Reflections*, ed. Pieter Bergé. Leuven: Leuven University Press.
- Cole, William. 1969. *The Form of Music*. London: The Associated Board of the Royal Schools of Music.
- Elliker, Calvin. 1994. "Classification Schemes for Scores: Analysis of Structural Levels." *Notes* 50, no. 4: 1269-1320. <http://www.jstor.org/stable/898291>.
- Hodge, Gail. 2000. *Systems of Knowledge Organization for Digital Libraries: Beyond Traditional Authority Files*. Washington DC: Council on Library and Information Resources. <https://www.clir.org/wp-content/uploads/sites/6/pub91.pdf>.
- Hjørland, Birger. 2008. "What is Knowledge Organization (KO)?" *Knowledge Organization* 35, no. 2/3: 86-101.
- Jacobs, Arthur. 1973. "Music." *A New Dictionary of Music*. 3rd edn. Harmondsworth: Penguin, 258.
- Lee, Deborah. 2015. "Consumption, Criticism and Wirkung: Reception-Infused Analysis of Classification Schemes." *Knowledge Organization* 42, no. 7: 508-521.
- Lee, Deborah. 2017. "Modelling Music: A Theoretical Approach to the Classification of Notated Western Art Music." PhD thesis, City, University of London. <http://openaccess.city.ac.uk/17445/>.

Leichtentritt, Hugo. 1951. *Musical Form*. Cambridge, Massachusetts: Harvard University Press.

Library of Congress. 2021. *Library of Congress Classification PDF Files*. Washington D.C.: Library of Congress. <https://www.loc.gov/aba/publications/FreeLCC/freelcc.html>.

Mazzocchi, Fulvio. 2018. "Knowledge Organization System (KOS)." *Knowledge Organization* 45, no. 1: 54-78. Also available in *ISKO Encyclopedia of Knowledge Organization*, eds. Birger Hjørland and Claudio Gnoli. <http://www.isko.org/cyclo/kos>.

Newman, William S. 1972. *The Sonata in the Classic Era*. 2nd edn. New York: The Norton Library.

Ojennus, Paul and Joseph T. Tennis. 2013a. "Modelling the Aesthetic Axis of Information Organization Frameworks, Part 1: Theoretical Basis." *Journal of Documentation* 69, no. 6: 807-826. Doi: 10.1108/JD-03-2012-0028.

Ojennus, Paul and Joseph T. Tennis. 2013b. "Modelling the Aesthetic Axis of Information Organization Frameworks, Part 2: Case Studies." *Journal of Documentation* 69, no. 6: 827-850. Doi: 10.1108/JD-03-2012-0029.

Pauer, Ernst. 1878. *Musical Forms*. London: Novello, Ewer and Co.

Prout, Ebenezer. 1893. *Musical Form*. London: Augener.

Reitz, Joan M. 2020. "Information Retrieval." *Online Dictionary for Library and Information Science*. Santa Barbara: ABC-CLIO, LLC. https://products.abc-clio.com/ODLIS/odlis_i.aspx.

Souza, Renato Rocha, Douglas Tudhope and Mauricio B. Almeida. 2012. "Towards a Taxonomy of KOS: Dimensions for Classifying Knowledge Organization Systems". *Knowledge Organization* 39, no. 3: 179-192.

Tennis, Joseph T. 2010. "Measured Time: Imposing a Temporal Metric to Classificatory Structures." In *Paradigms and Conceptual Systems in Knowledge Organization: Proceedings of the Eleventh International ISKO Conference, 23-26 February 2010, Rome, Italy*, eds. Claudio Gnoli and Fulvio Mazzocchi. Würzburg: Ergon, 223-228.

Tennis, Joseph T. 2013. "Metaphors of Time and Installed Knowledge Organization Systems: Ouroboros, Architectonics, or Lachesis?" *Information Research* 8, no. 3. <http://informationr.net/ir/18-3/colis/paperC38.html>.

Webster, James. 2001. "Sonata Form." *Grove Music Online*. <https://doi.org/10.1093/gmo/9781561592630.article.26197>.

Whittall, Arnold. 2001. "Form." *Grove Music Online*. <https://doi.org/10.1093/gmo/9781561592630.article.09981>.

Zeng, Marcia Lei. 2008. "Knowledge Organization Systems (KOS)." *Knowledge Organization* 35, no. 2/3: 160-182.