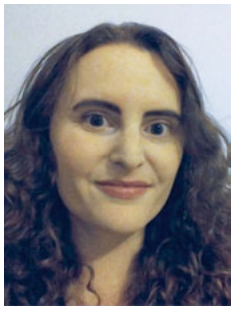
Numbers, Instruments and Hands: The Impact of Faceted Analytical Theory on Classifying Music Ensembles †

Deborah Lee

City, University of London, Centre for Information Science,
Northampton Square, London EC1V 0HB,
<deborah.lee.1@city.ac.uk>

Deborah Lee was awarded her PhD in library and information science in May 2017 from City, University of London. Her thesis, entitled "Modelling Music: A Theoretical Approach to the Classification of Notated Western Art Music," was supervised by Professor David Bawden. Her research interests include music classification, the theory and aesthetics of classification schemes, music as information, and the pedagogy of cataloguing education. From August 2017, Deborah will be a visiting lecturer at City, University of London. She is also the Senior Cataloguer at the Courtauld Institute of Art book library and an onsite trainer for the Chartered Institute of Library and Information Professionals (CILIP).



Lee, Deborah. 2017. "Numbers, Instruments and Hands: The Impact of Faceted Analytical Theory on Classifying Music Ensembles." *Knowledge Organization* 44(6): 405-415. 22 references.

Abstract: This article considers a particularly knotty aspect of classifying notated music: the classification of instrumental ensembles, where the term ensembles is defined as music written for multiple players with only one player per part. Facet analysis is used to examine this area of music classification and as the basis of a model for classifying ensembles. The conceptual analysis is aided by examples drawn from two classification schemes: *British Catalogue of Music Classification* (*BCMC*) and Flexible Classification. First, this exploration reveals that there are conceptually four sub-facets for classifying instrument ensembles, and that the omission of any of these sub-facets causes issues within classification schemes. Next, the different type of relationships between pairs of these sub-facets is delineated, including hierarchical and associative relationships. The classification of ensembles is depicted in a novel way, as a series of inter-connected relationships between sub-facets. Finally, the article ascertains exactly what is being counted, including introducing potential extra sets of sub-facets pertaining to performers and hands. So, facet analysis helps to create a model for classifying instrumental ensembles which provides a novel solution to this historically problematic area of music classification, as well as suggesting a potentially generalizable new way of thinking about complex relationships between sub-facets.

Received: 6 August 2017; Accepted 7 August 2017

Keywords: music classification, facets, sub-facets, instruments, ensembles, relationships

† The author would like to thank Prof. David Bawden for his advice in preparing this article.

1.0 Introduction

Classifying notated music is notoriously thorny. Indications of music classification's complexities can be seen in the quantity of discussion about music classification in library and information science literature (see, for instance, Smiraglia and Young's 2006 bibliography), the numerous classification schemes devoted to music classification, and the historic inadequacies of existing classification schemes for music (Clews 1975; Olding 1954). This article considers a particularly knotty aspect of music classification: the classification of instrumental ensembles, where "instrumental ensembles" is used as a term to denote music written for multiple players with only one player per part. Examples of ensembles include string quartet, duet for two flutes and trio for horn, trumpet, and trombone, and so on.

Classifying instruments has proven to be problematic for bibliographic classification schemes. For instance, even music classification schemes which are intended to be fully faceted, such as the *British Catalogue of Music Classification* (*BCMC*) see their faceting break down when dealing with instrumental ensembles; *BCMC* (Coates 1960) not only has compound classes for ensembles in its main schedules, but these compound foci are not the addition of the relevant simple foci. In other words, ensembles break the faceting even of a celebrated faceted classification scheme. Classification complications with

instrumental ensembles is not limited to the distant past: for instance, the detailed 2016 working paper for *Dewey Decimal Classification* (2016) about classifying ensembles and the ensuing discussion illustrates how this area of music classification is still mired in complexity.

Faceting will be used as a framework for exploring the classification of instrumental ensembles. According to La Barre (2010, 245) there is no singly agreed definition of facet analysis. In this article, a very loose definition is utilized, which considers facet analysis as the breaking of complex subjects into their most fundamental or elemental concepts (Langridge 1992; Broughton 2004; La Barre 2010). Music occupies a special place within the development of faceted classification; for example, *BCMC* was the first fully-faceted scheme in Great Britain (Redfern 1978) and formed the basis of the *Dewey Decimal Classification* phoenix schedule (Sweeney 1976) whose basic structure still exists as part of the modern-day *Dewey Decimal Classification*. From a classification perspective, the issues concerned with classifying ensembles centre upon number. In faceted classification terms, the ensemble conundrum is actually the story of what happens when number-of-things facets meet types-of-things facets within music classification. Number-of-thing is a common facet or sub-facet within all subjects; however, music adds extra levels to the complexity by introducing (at least) two extra sub-facets.

This article provides a theoretical analysis and models of the classification of instrumental ensembles. It also draws upon examples from existing classification schemes in order to illustrate certain classification phenomena. Two example special schemes for music are used for illustrative purposes: *BCMB* (Coates 1960) and *A Flexible Classification System of Music and Literature on Music*, shortened to "Flexible" (Pethes 1967). While *BCMC*'s significance to faceted classification history makes it an interesting example for this article, Flexible's usefulness stems from its intentions towards universality, its detailed schedules, and its origins as an extension to *UDC*. The first part of the article breaks down the ensembles conundrum and posits that there are actually four sub-facets at work. This is followed by an exploration of the relationships between those sub-facets and how different pairs of relationships demonstrate different qualities. The third section asks exactly what are we counting in the first place, using an important example of keyboard instruments to show that for some scenarios there are potentially more than four sub-facets. Thus, by modelling the sub-facets of instrumental ensembles and their relationships, an innovative model is proposed which could be used as a tool to critique, construct and edit classification schemes for music.

2.0 Breaking down the classification of ensembles

The first task is to ascertain what sorts of information are needed to classify instrumental ensembles, such as the types of information present in the combination of two flutes (also called a flute duet). To start, there are two types of sub-facet involved: number-of-thing and type-of-thing. Note that this article uses the term "sub-facet" in a specific way, as an array within a facet. The types of information discussed in this article, such as numbers of instruments could be considered as a facet of music, or instead, as a sub-facet of musical medium. So, while this article treats medium as a facet of music, with types of information which are part of musical medium as sub-facets, it acknowledges that this is just one possibility and the structure of music is not fixed. Actually, there is a further question about whether the number of instruments is a separate sub-facet at all or merely an ordering device of foci within a sub-facet. Its appearance as the latter is taken as given by Langridge (1992, 49), who uses solo, duets, trios, and so on, as an example of order within a facet. Alternatively, the number of musicians in an ensemble could be extracted and treated as a separate sub-facet. The two approaches are visualized in Figures 1 and 2. However, as this article is concerned with faceted classification, number-of-thing is assumed to be a sub-facet in this article, not an ordering device.

The flute duet example above was deceptively simple: there was only one kind of instrument involved, yet within Western art music it is more common to find ensembles which contain different types of instruments. Examples which include different types of instruments include the piano trio (piano, cello, and violin) or a bassoon and clarinet duet. The complications which occur from having multiple types-of-things will become evident as this article unfolds.

So, one way to classify instrumental ensembles is to have two sub-facets: the type of instrument and the number of occurrences of that individual instrument. This would give a precise indication of everything that is contained within the ensemble. This is visualized in Figure 3, which gives the foci for two violins, two violas, and one cello, known as a string quintet. However, this approach has something missing: the qualities associated with being a specific ensemble size and the qualities shared (or not) by all the instruments in that ensemble. For instance, a string quintet possesses qualities associated with the interactions between the five parts, which have a different nature from something written in two parts; similarly, a work for all stringed instruments has a certain timbre associated with its overall string-ness. Furthermore, for some ensembles such as the string quartet, the compound term for that specific group of four instruments implies information

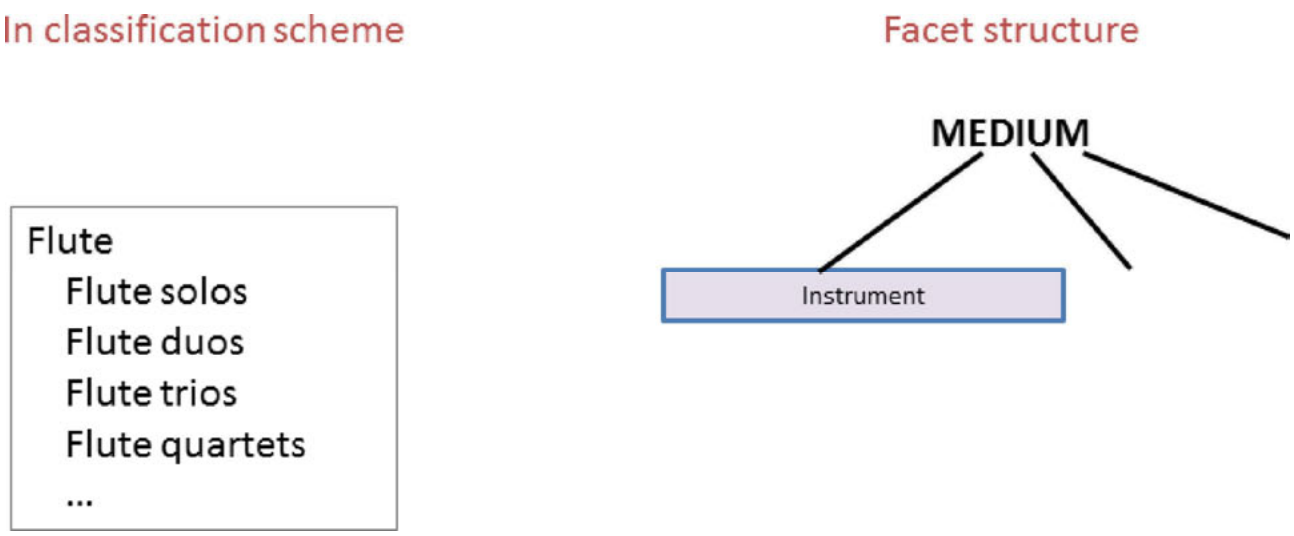


Figure 1. Example of the number of instruments used as ordering tool.

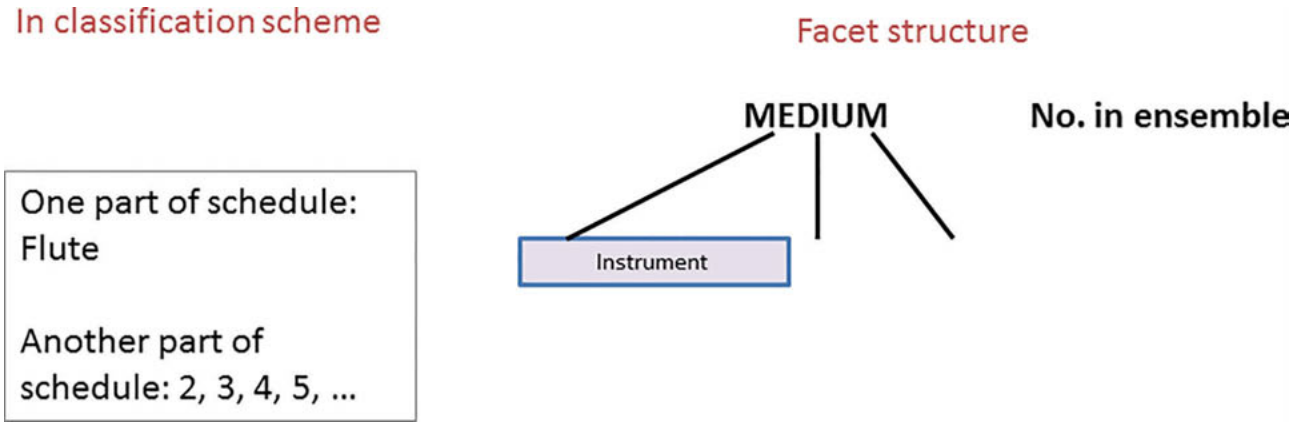


Figure 2. Example of the number of instruments used as a separate sub-facet.

about genre. So, just classifying the combination of four individual instruments in a string quartet would omit a defining feature of its medium. Therefore, it is clear that only representing each instrument and number of that instrument would be problematic.

An alternative approach is to classify the whole ensemble rather than the constituent instruments, a method partially adopted by *BCMC*. There would be two sub-facets: "instrument family" and "total number of instruments." Example foci of instrument family include string, wind, brass, and so on. Note that what constitutes an instrument family is not straightforward (see 3.0 below); examples of total number of instruments include two, three, four, and so on. This approach is visualized in Figure 4. The advantages of classifying using this pair of sub-facets include collocating similar repertoire together, based on an assumption that similar category(ies) and number of instruments in an ensemble mean similar musical works. There is also a genre implication to this assumption of similarity based on shared timbre. However, vital information about exactly which instruments are involved is missing if only these two sub-facets were adopted: for example, "string" and "five" are not the most useful foci for retrieving music which specifically involves a cello.

Therefore, it is clear that there are actually four useful types of information for instrument ensembles, with symbols assigned for ease of reference: instrument family (I), total number of instruments (N), instrument (i) and number of each instrument (n). Note that the number sub-facets (N and n) have different meanings, yet the list of possible foci (ordinal, whole, positive numbers, such as two, three, and so on) is the same for both sub-facets. In fact, for ensembles containing only one type of instrument, such as the flute duet, the focus for N and n might be exactly the same; N can sometimes equal n.

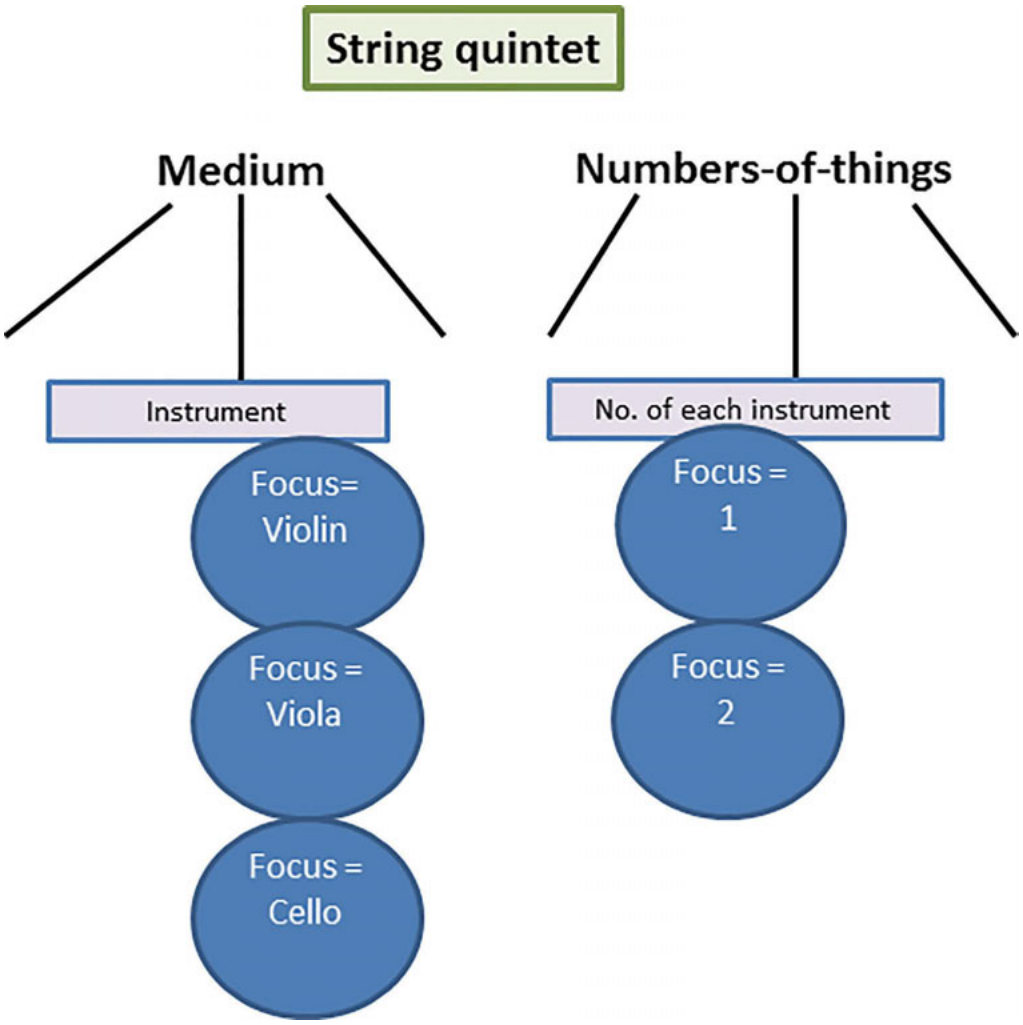


Figure 3. Example of the number of individual instruments and type of each instrument for a string quintet.

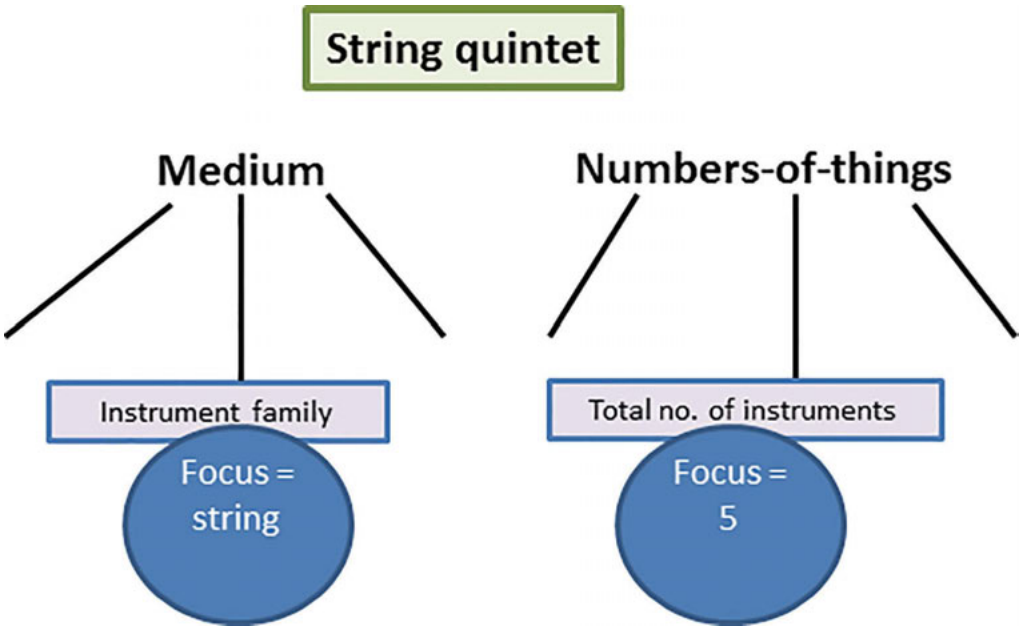


Figure 4. Example of the total number of instruments and the instrument family for a string quintet.

However, it is more likely that the ensemble consists of different instruments; for example, a string quintet has five instruments, but two violins. So, although N = n is possible, N ≠ n in most cases. Conversely, it would not be possible for the instrument family (I) and type of instrument (i) to have the same focus, as they have different lists of possible foci.

While theoretical analysis of music itself reveals four sub-facets at play for the medium of ensembles, schemes such as *BCMC* and Flexible illustrate how the quadripartite conceptualisation of ensembles into four sub-facets is not always reflected in the structure of bibliographic schemes. For example, Flexible (Pethes 1967) only allows the classifier to build ensembles using the total number of instruments (N) and addition of individual instruments (i), with no facility for saying how many of each instrument is present (n) nor the instrument family (I). So, this suggests that bibliographic schemes do not inevitably delineate these four, ensemble-related sub-facets.

3.0 The complex web of relationships between the sub-facets of ensembles

The relationships between these sub-facets now need consideration. In order to do this, discussions and typologies of relationships from the area of thesaurus construction are useful. While the idea and meaning of relationships may be different in thesauri and faceted classification (as thesauri deal with paradigmatic relationships only, while faceted classification schemes support paradigmatic relationships, syntagmatic relationships, and phase relationships), the delineation of relationship types in thesauri can be usefully borrowed as a very loose framework for unpicking and exploring the relationships between sub-facets for instrumental ensembles.

3.1 Relationships between number-of-thing and type-of-thing

The first type of relationship to explore is the interactions between sub-facets i and n, and between I and N. From a theoretical perspective, each number-of-thing (n and N) cleaves to its relevant type-of-thing (i and I). For instance, when there is a string quintet consisting of two violins, two violas, and a cello, a classification which only has five and violin as its foci would be an untrue classification: there are five stringed instruments, including two violins, but there are not five violins. This raises interesting questions about the nature of the number sub-facets. Taken as individual sub-facets, it could be argued that N and n are not even part of medium at all, as they are general sub-facets applicable to many disciplines and unrelated to medium in their knowledge type; however, they are also arguably meaningless if taken separately, for the number of each instrument has no meaning without being followed by a focus stating the type of instrument. In fact, what we have are two closely-bound pairs: NI and ni. These show how in both cases, type-of-thing cleaves to number-of-thing. So, there are five string instruments because NI are cleaved together, but there are not five violins because N and i do not have this direct relationship. The relationship between n and i is visualized in Figure 5 using the example of a string quintet.

3.2 Hierarchical relationships within number-of-thing and type-of-thing

There are also relationships between N and n, and between I and i. These both could be described as hierarchical, parent-child relationships; this is in contrast to the associative relationships seen between N and I, and n and i. The relationship between the total number of instruments and the number of individual instruments could reasonably be described as "whole-part," also known as a partitive relationship (Broughton 2006). For example, a string quintet would have a focus of N as five; this includes the (repeatable) sub-facet of number of individual instruments with three separate foci (two, two, and one). If an extra cello (say) was added in, and values of each n became two, two, and two, then N would no longer be five but six; the foci of each n must collectively sum the foci of N.

While the relationship between instrument family (I) and type of instrument (i) is also hierarchical, it is more aligned to a generic/genus-species (Broughton 2006) relationship than whole-part. All the violins and cellos in the world will not add up to being "string;" they are types of string instruments. This is a simplification and the categorization of instruments is complex, including the role of categories such as instrumental family. The categorization systems and structures for musical instruments are occasionally discussed in knowledge organization, either as the primary focus or as an example of a classification phenomenon, see for example, Ghirardini and Gnoli (2005), Gnoli (2006), Lee (2014) and Lee (2017). In particular, note that there are intervening layers of hierarchy between an instrument such as violin and an instrumental family such as string, as illustrated for instance, by the numerous levels in the seminal instrument taxonomy by Hornbostel and Sachs ([1961] 1992); delineating and defining such levels is not easy, as evident by the discussion and recent amendment to *Dewey Decimal Classification* (2016). So, for simplicity, this article uses the term "instrument family" in a deliberately loose way.

Therefore, classifying ensembles is actually a series of inter-connected relationships between sub-facets. The full

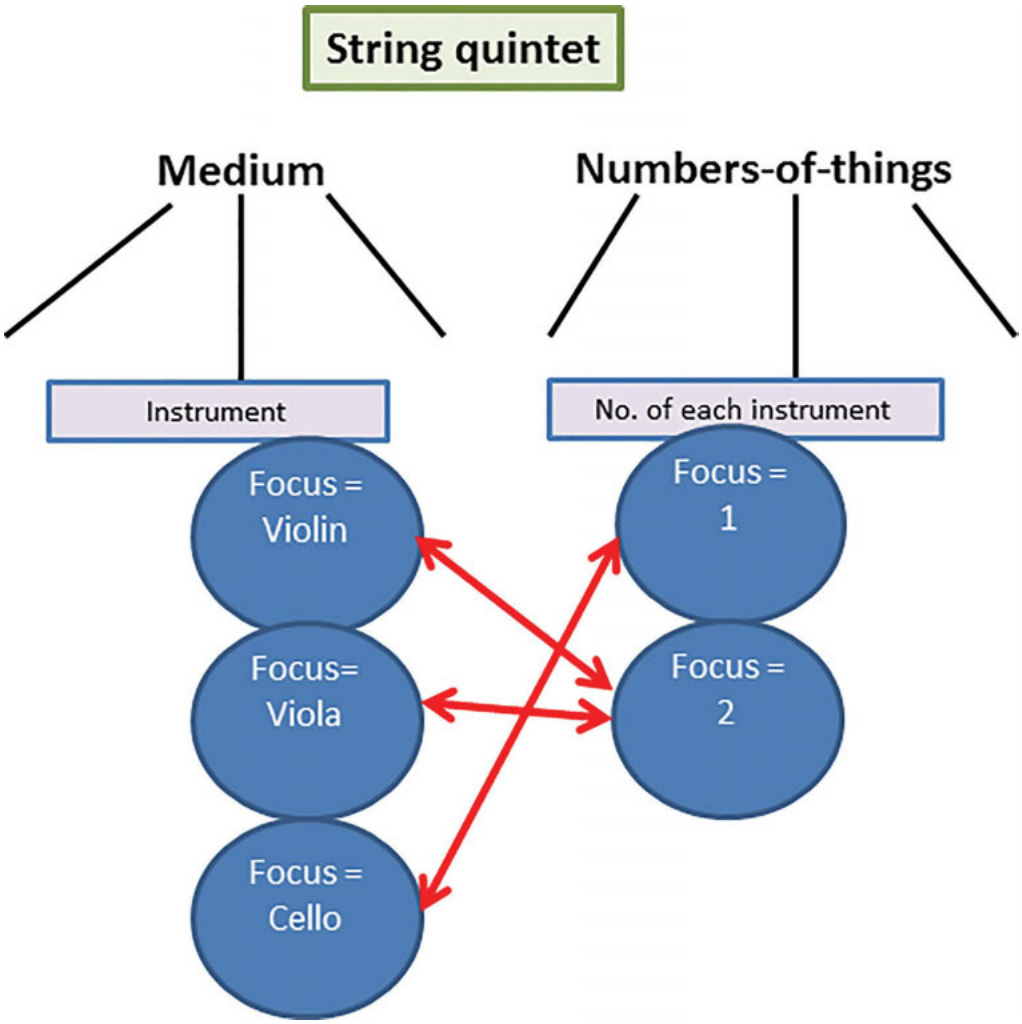


Figure 5. Example of the connections between n and I for a string quintet.

set of relationships is visualized in Figure 6. The associative relationships between N and I, and n and i, are expressed using double-headed arrows, showing that these pairs of sub-facets are inter-connected and the connections run mutually in both directions. The hierarchical relationships between N and n, and I and i, are represented by dotted lines. Note that each sub-facet is only connected to two out of the three other sub-facets. No direct connection is indicated between, say, total number of instruments and type of instrument, a visualisation of the meaninglessness of five and violin for classifying a string quintet. In addition, there is an assumption that there will be repetitions for each instrument sub-facet and its corresponding number of each instrument; for example, a string quintet would include three iterations of the instrument sub-facet (violin, viola, and cello) and each would be attached to the same foci in the instrument family sub-facet (string). So, Figure 6 presents a web of interdependent sub-facets with their corresponding relationships; while it does not necessarily reflect the structure of existing bibliographic classification schemes, it could be used to understand the issues in existing schemes and to create schemes in the future.

4.0 Instruments, performers or hands: ascertaining what is being counted

The third part of the article attempts to ascertain what exactly is being counted within instrumental ensembles. Bibliographic classification schemes tend to represent the object (instrument) rather than the agent (performer); for instance, schemes generally have foci for violin, viola, and cello, rather than violinist, violist, and cellist. However, this object approach can become problematic in certain situations, such as those involving the piano and other keyboard instruments. Therefore, a sojourn into the issues of classifying works involving the piano is now of-

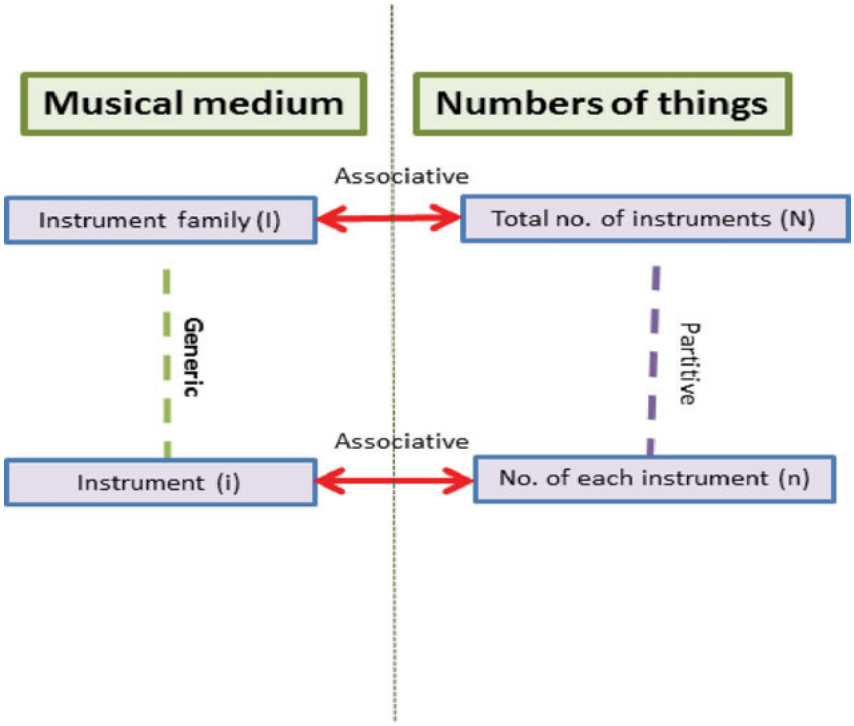


Figure 6. Relationships between sub-facets relating to instrumental ensembles.

fered, in order to elicit the unit of classification for musical medium.

4.1. Pianos versus pianists

The difficulties of pianos and multiples lie in what is being counted. The piano duet is a common medium representing two people playing one piano; in other words, it is two agents and one object. In contrast, a flute duet would represent two people each playing their own flute, so two agents playing two objects. To complicate piano matters further, there is a piano equivalent of the flute duet: two people playing two pianos. Moreover, not only are piano duets and two-piano music different mediums, they also have different repertoire, so it is important that music classification can differentiate between the two.

So, music classification could be considered to have an extra element: the performers. For example, the foci for number of instruments, number of performers and instrument for a piano duet would be represented by the foci of one, two, and piano (respectively); conversely, the foci for these same sub-facets for work for two pianos would be represented by two, two, and piano (respectively), as shown in Figure 7. However, as for instruments, performers is actually two units: the type of performer and the number of each type of performer. An example focus in the type of performer sub-facet would be pianist and an example focus in the number of each performer sub-facet would be two. Adding in these extra two sub-facets to the system of instruments and their families described in earlier sections, there are now six sub-facets rather than four.

The next task is to consider how type of performer and number of each performer sub-facets relate to the other four sub-facets. The focus of pianist is really shorthand for someone or something that plays the piano, so there is a strong relationship between the instrument (object) and type of performer (agent). However, this associative relationship does not seem to fall neatly into examples offered within thesaurus construction literature. For instance, using the list of types of "associative linkage" in ISO 25964-1:2011 (en) (2011, 64), the relationship between, say, a piano and a pianist could be described as two iterations of the second type of associative relationship, "An operation or process and its agent or instrument." One iteration associates the object (piano) with the process of playing it (piano playing), and another iteration of this relationship connects the process (piano playing) with its agent (pianist). In addition, there does not appear to be a direct relationship between number of each performer and other sub-facets. While for most music the number of performers matches the number of instruments, the piano examples show that this is not always true: having one piano could mean one, two, or three (or more) pianists. The relationships between all six sub-facets are illustrated in Figure 8, which extends the

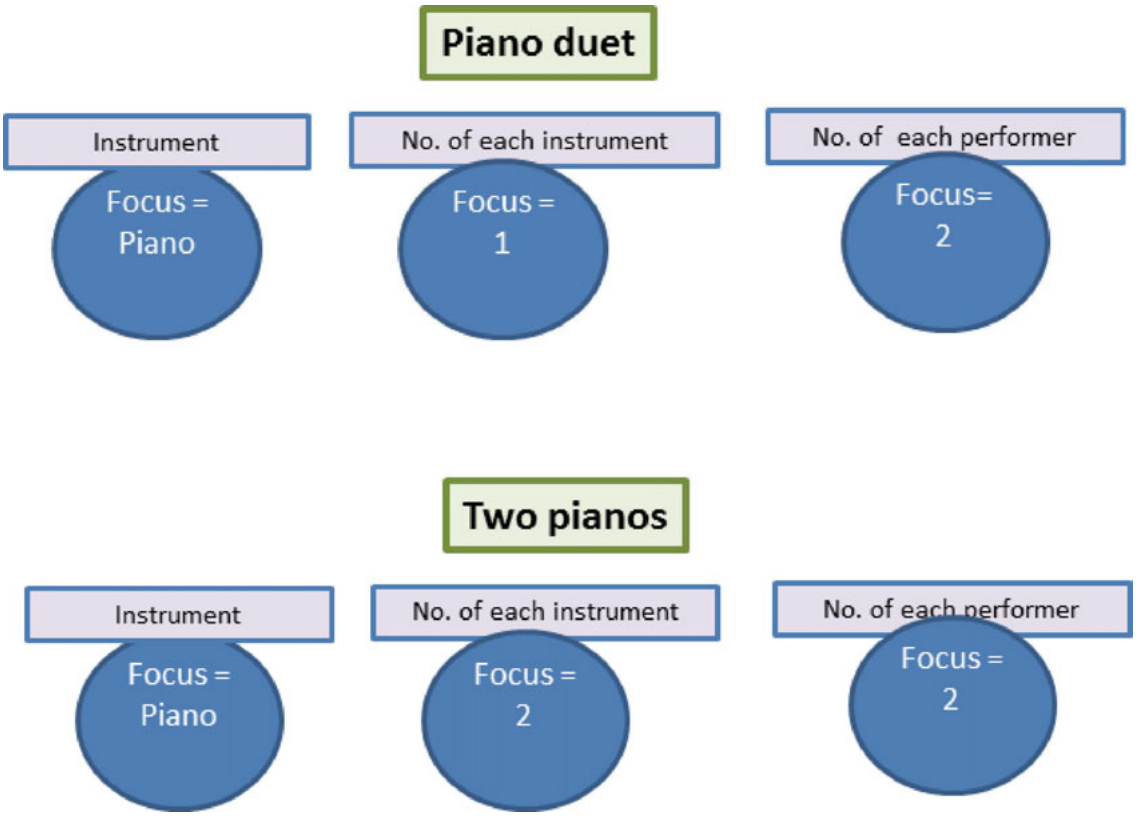


Figure 7. Instrument, number of instrument and number of performers for piano duet and two pianos.

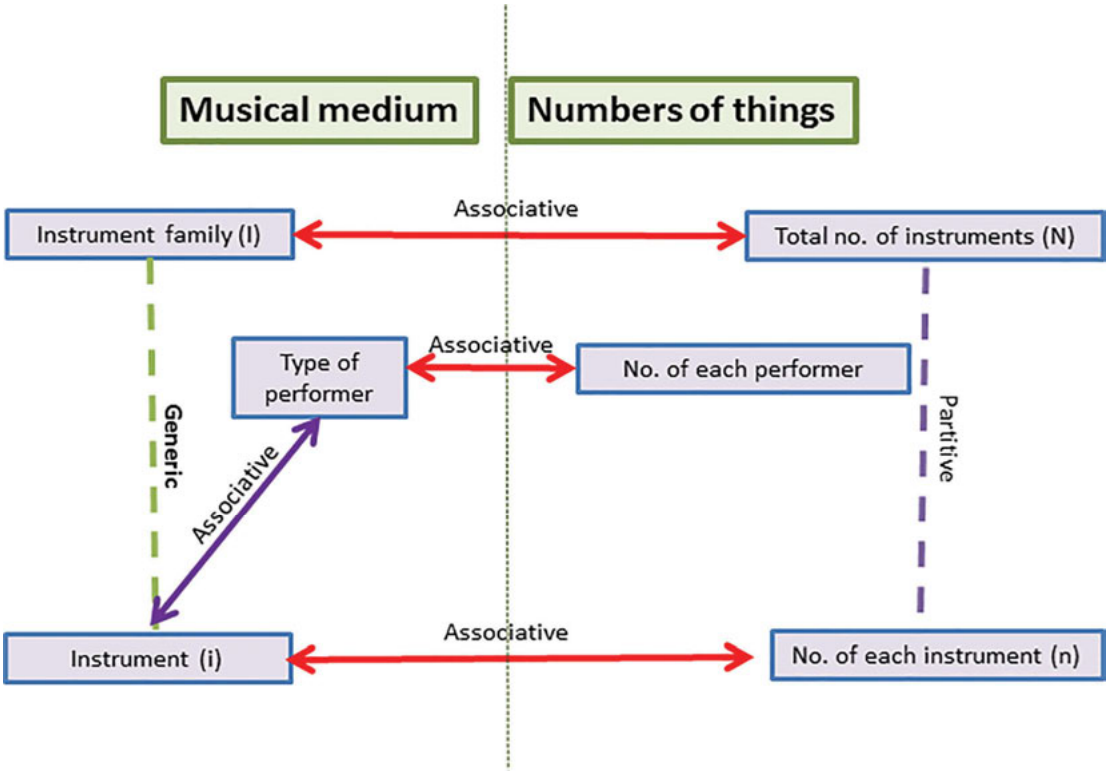


Figure 8. Extension to model for performers.

model of classifying instrumental ensembles to incorporate performers. Associative relationships are shown using double-headed arrows, and hierarchical relationships with broken lines. Note how the original loop is now broken, as number of each performer only links to one other sub-facet.

The piano examples are not the only type of situation to challenge the hegemony of object-based music classification. Music for percussion presents almost exactly the opposite problem: more instruments than performers. For example, a work for solo percussionist featuring a marimba, wood block, and side drum, is for one performer but three instruments. However, Figure 8 could also accommodate this example (with a bit of squashing). The three instrument foci (marimba, wood block, and side drum) would each be attached to their corresponding type of performer (marimba player, wood block player, and drummer); however, unlike the examples for piano duet or music for two pianos, each type of performer sub-facet (marimba player, wood block player, and drummer) could be attached to the same, single iteration of the no. of each performer sub-facet (in other words, one), thus expressing how multiple types of performers are actually the same person. Thus, it is shown that the ensemble model as seen in its Figure 8 formation can accommodate a variety of difficult performer-related classification scenarios.

4.2. Pianists, hands and other parts of the body

Music for multiples and pianos can also involve another unit: hands. While we would traditionally expect that each pianist would play with two hands, this is not always the case. There is a small repertory of music specifically written for the left hand only: for example, the pianist Paul Wittgenstein, who lost his right arm during World War I, inspired virtuosic works for left-hand only including Ravel's piano concerto for left hand, and Prokofiev's piano concerto number 4 (Zank 2009; Andersen and Preston 2016).[1] If this music were classified just using the six sub-facets described in Section 4.1., there would be no difference between music for one pianist using two hands, and music for one pianist using just one hand. Sometimes classification schemes do acknowledge that there are not always two hands for every performer; for instance, *BCMC* includes music for left hand at the end of its table for keyboard ensembles. Flexible goes one stage further; it lists foci for various combinations which involve odd numbers of hands. However, while it is useful to see how *BCMC* and Flexible acknowledge the existence of hands as an important classification unit, both seemingly just order the array rather than treat hands as a separate sub-facet.

So, another pair of sub-facets can be added to the model: "part of the body" and "no. of part of the body" (allowing for any part of the body, though the focus is almost exclusively going to be hands). Again, we need to consider how these two extra sub-facets fit with the other sub-facets. The relationship between a part of the body and a type of performer could be described as partitive, as hands are one constituent part of a pianist; see for example, the first type of whole-part relationships "Systems and Organs of the Body," given in Aitchison, Gilchrist, and Bawden (2000, 58). The relationship between part of the body and number of parts of the body is associative, as one describes the thing and the other, the number-of-thing. More complex is the nature of the relationship between number of parts of the body and number of performers. On one side of the argument, there have to be between one and two times as many hands as pianists; on the other side of the argument, the reason a musical work is, say, for one not two hands is determined by the context of the composition's creation, rather than being entirely and automatically determined by the number of performers. All of these relationships are visualized in Figure 9. Note that there is now an extra loop. Also of interest is how the associative relationship between number of performers and number of parts of the body is in the vertical rather than horizontal plane, unlike the other associative relationships.

5. Conclusion

Classifying ensembles is historically complex. This article has used facet analysis in order to perform in-depth analysis on this problematic area of music classification. The analysis showed how music itself identifies a significant number of types of information relating to ensembles that need classifying, yet the two illustrative schemes (*BCMC* and Flexible) include only a small number of these sub-facets in the structure of their schemes and classification orders. This article identified which sub-facets should be present in classification schemes for music and gave an example of how a scheme which omitted some of these sub-facets struggled to maintain its faceting for this area of music. The article then contemplated these sub-facets through the lens of their relationships with each other, utilizing typologies and discussions about relationships from thesaurus construction literature. The analysis and resulting models proved fruitful. First, the model of classifying ensembles, with its two extensions, demonstrates the sheer complexity of classifying instrumental ensembles. Second, the model shows that there are actually four (or six, or eight) sub-facets, and this could explain why classification schemes, which typically only allow for a few of these sub-facets, struggle

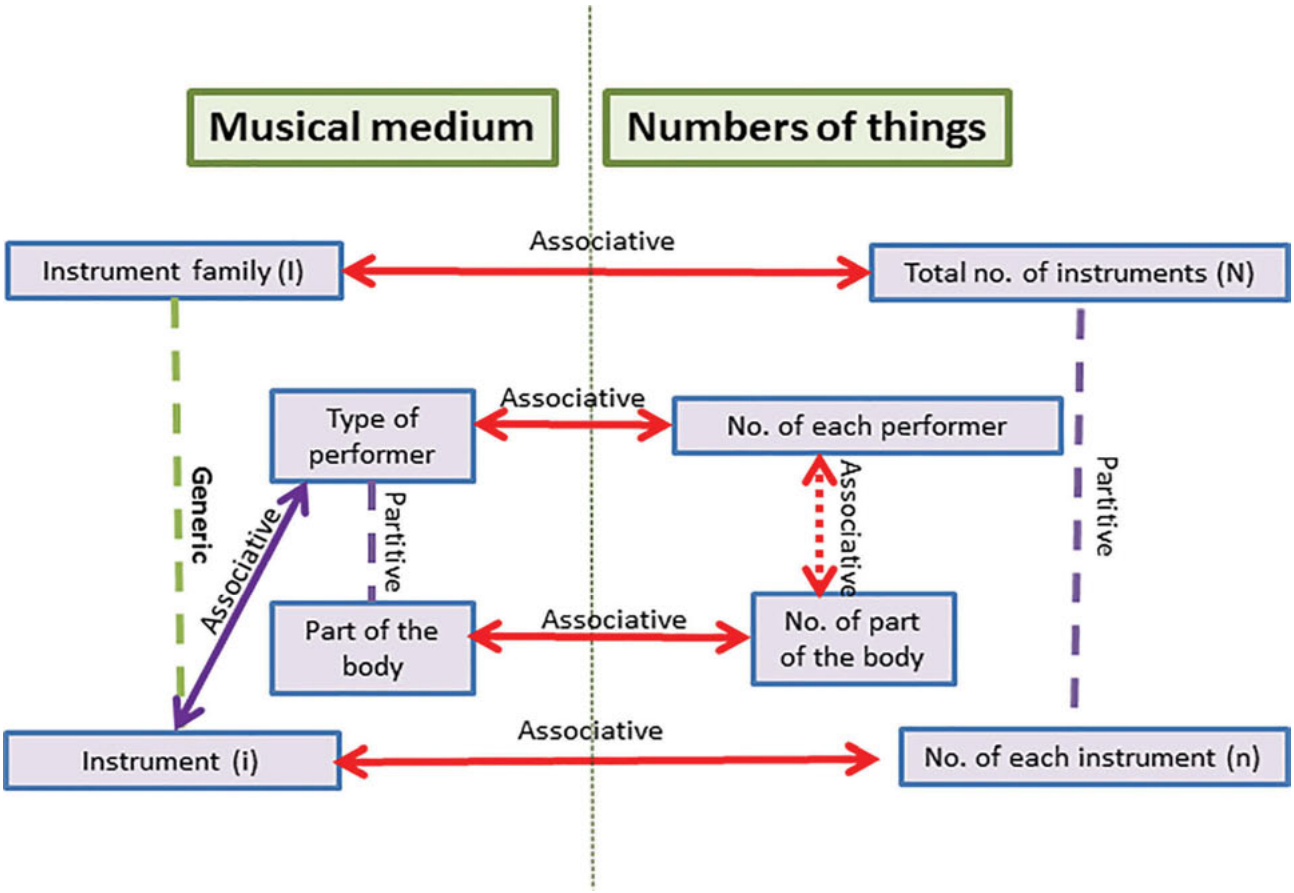


Figure 9. Extension to model to incorporate parts of the body.

with classifying ensembles. Third, by specifically considering relationships, it has been shown how the sub-facets are related to each other in a web of interconnections, contravening any sense of independence between sub-facets. Furthermore, these relationships form a loop of connections or even a double loop, again, giving some indication as to why classification schemes may disassemble when dealing with instrumental ensembles. Fourth, considering the idea of performers and hands showed that what is being counted is surprisingly flaccid: while most instrumental music only needs to count the instruments, for other types of ensembles additional types of unit are needed. Although this article specifically explored instruments, future research could see its extension to voices, groups and combinations of voices, groups and instruments, in other words, remodelling musical medium in its entirety. So, for those seeking to understand music's complexities, the model presents one piece of the music classification puzzle.

There are also potential practical uses for the model; although the various iterations of the model are not actually classification schemes, nor do they suggest a citation order or tackle the difficult question of how such a complex system would be notated, they do provide a potential structure to build a knowledge organization system in the future. Such a classification scheme could provide a radically different prospect for the classification of instrumental ensembles within printed music, digital notated music, and music-as-sound.

However, the results go further than just helping to understand music classification. The product of this analysis of music's sub-facets and the relationships between them could prove useful when analysing other subjects which possess the same kinds of complexity. The conceptualization of classification loops and a deep analysis of types of relationships between sub-facets could help to disentangle classificatory knots in other subjects too. For instance, in some regards, the different reactions between two ester functional groups in chemistry, Claisen condensation and Dieckmann condensation, present a similar classification situation to the piano duet/two piano situation within music; this is just one possible situation where using the analysis and model developed for classifying music ensembles could be applied to a com-

pletely different subject. Unfortunately, due to space constraints, more detail and other possible examples cannot be offered in this article, but this would be a natural extension for future research. So, using existing theories of facet analysis and relationships in a novel way not only provides a new way of understanding and restructuring the classification of instrumental ensembles, but also illuminates a potential new path for utilising facet analysis for other, complex subjects.

Note

1. Ravel, Maurice, *Piano Concerto for the Left Hand in D major*; Prokofiev, Sergei, *Konzert Nr. 4 für Klavier (linke Hand) und Orchester, B-dur, Opus 53*.

References

Aitchison, Jean, Alan Gilchrist, and David Bawden. 2000. *Thesaurus Construction and Use*, 4th ed. London: ASLIB.

Anderson, Ronald Kinloch, and Katherine K. Preston. 2016. "Wittgenstein, Paul." In *Grove Music Online*. http://www.oxfordmusiconline.com

Broughton, Vanda. 2006. *Essential Thesaurus Construction*. London: Facet.

Broughton, Vanda. 2004. *Essential Classification*. London: Facet.

Clews, J.P. 1975. "Revision of DC 780: The Phoenix Schedule." *Brio* 12: 7-14.

Coates, E. J. 1960. *The British Catalogue of Music Classification*. London: Council of the British National Bibliography.

Dewey Decimal Classification. 2016. EPC Exhibit 139-S78.1: 785.6-785: Ensembles Consisting of only one Instrumental Group. Exhibit for Editorial Policy Committee 6-7 June 2016, by R. Green. Dublin, Ohio: OCLC.

Gnoli, Claudio. 2006. "Phylogenetic Classification." *Knowledge Organization* 33: 138-52.

Ghirardini, Cristina, and Claudio Gnoli. 2005. "Zampogne e libri sulle zampogne: Classificazioni diverse." *Bibliotime* 8, no. 3. http://www.aib.it/aib/sezioni/emr/bibtime/num-viii-3/gnoli.htm

Hornbostel, Erich Moritz von, and Carl Sachs. (1961) 1992. "Classification of Musical Instruments." In *Ethnomusicology: An Introduction*, ed. Helen Myers. London: Macmillan, 444-61.

International Organization for Standardization. 2011. *ISO 25964-1: Information and Documentation—Thesauri and interoperability with other vocabularies - Part 1: Thesauri for information retrieval*. Geneva: International Organization for Standardization.

La Barre, Kathryn. 2010. "Facet Analysis." In *Annual Review of Information Science and Technology 44*, ed. Blaise Cronin. Medford, N.J.: Information Today, 243-84. doi:10.1002/aris.2010.1440440113

Langridge, D. W. 1992. *Classification: Its Kinds, Elements, Systems and Applications*. Topics in library and information studies. London: Bowker-Saur.

Lee, Deborah. 2017. "Modelling Music: A Theoretical Approach to the Classification of Notated Western Art Music." Ph.D. diss., City, University of London. http://openaccess.city.ac.uk/17445/

Lee, Deborah. 2014. "Webs of 'Wirkung': Modelling the Interconnectedness of Classification Schemes." In *Knowledge Organization in the 21st Century: Between Historical Patterns and Future Prospects; Proceedings of the Thirteenth International ISKO Conference 19-22 May 2014, Kraków, Poland* ed. Wieslaw Babik. Advances in Knowledge Organization 14. Würzburg: Ergon Verlag, 200-7.

Olding, R.K. 1954. "A System for Classification for Music and Related Materials." *Australian Library Journal* 3: 13-8.

Pethes, Iván. 1967. *A Flexible Classification System of Music and Literature on Music*. Budapest: Centre of Library Science and Technology.

Redfern, Brian. 1978. *Organizing Music in Libraries*, 2nd ed., vol. 1, *Arrangement and Classification*. London: Clive Bingley.

Smiraglia, Richard P., and J. Bradford Young. 2006. *Bibliographic Control of Music, 1897-2000*. Music Library Association index and bibliography series 32. Lanham, Md.: Scarecrow.

Sweeney, Russell. 1976. "Music in the Dewey Decimal Classification." *Catalogue and Index* 42 (Autumn 1976): 4-6.

Zank, Stephen. 2009. *Irony and Sound: The Music of Maurice Ravel*. Rochester, N.Y.: University of Rochester Press.