Identifying and Classifying the Phenomena of Music

Abstract:
The classification of music for information retrieval has a long history, predominantly associated with the distribution of printed music in classes based on musical medium and form. Recent research has delved into specific aspects of the classification of music such as performance and reception, in addition to the finer aspects of medium and form. Meanwhile, new input from the music information retrieval community has pointed to the potential richness of music classification that takes into account a range from simple aboutness to more auditory concepts such as listener emotion, holistic user experience, or task complexity. The extension of the classification of music in the Basic Concepts Classification requires a larger embrace of musical phenomena. A large array of musical phenomena is identified, leading to a flexible but exhaustive system of facets, and documenting the grammar of a facet analytical approach to classification of musical phenomena. A synthetic approach within a general (universal) classification can facilitate classification along diverse dimensions such as the subject of a work, the composer’s intentions, and the intended audience.

1.0 Introduction: Classifying music

The classification of music for information retrieval has a long history (Smiraglia 1989; McKnight 2002). Much of the richness of the history of the creation of music classification schemes arises from the professionalization of music librarianship in the United States and United Kingdom from the early twentieth-century forward. By the mid-1950s the growth of specific practices in music libraries was synthesized as the distribution of printed music in classes based on musical medium and form (Meyer-Baer 1951 [1973]; Elmer 1957 [1973]). Meyer-Baer contrasted the broad categories (church music, vocal music, keyboard music, etc.) of the Dewey Decimal Classification with the granular medium-based arrays of the Library of Congress Classification: M, and then placed those over and against a simple pragmatic local classification that allowed the addition of style period indicators. A hallmark of music classification was the 1938 Dickinson Classification of Musical Compositions, originally developed at Vassar College but eventually used also at Columbia University and The Juilliard School. Dickinson’s classification is medium-based, but uses a complex system of composer “book numbers” to create alpha-numeric arrays of a composers’ works within a class, and also somewhat precociously makes use of what we now call facet analytical theory by permitting the addition of symbols and letters to introduce faceted indicators for arrangement, voice range, excerpt, etc. Sound recording collections, especially those in public libraries, also contributed what now might be called “best practices” by generating highly pragmatic classifications that mimicked those of record stores, in which bins based on broad themes--e.g., Operas, Piano, Musical Shows, Jazz Music, Holiday Music, etc.--allowed library users to browse through and select among LP recordings (see “ANSCR” in Smiraglia 1989, 114ff.).

Recent research has delved into specific aspects of the classification of music such as musical performance and reception (Lee 2011, 2015), in addition to the finer aspects of medium and form, including musical medium and music ensembles (Lee 2017a, 2017b; Lee and Robinson 2017). The idea of a performance as an entity separate from
the musical work, its printed instantiations, or recordings of its expressions, is critical but has received only little attention. Smiraglia (2007) demonstrated empirically the instantiation network of a set of performances, which can be thought of as “works” distinct from the musical abstractions in them. Twelve years after this paper only a few scholars have thought to distance themselves from the error of considering a performance to be a direct instantiation of a work. Cruz and Smiraglia (2020), who work with Brazilian popular music, is a notable example. For them performance of a “musical idea” instantiated through both “arrangements” and “performance expressions” is fully modeled without reference to what would be subsequently-created notated documents or recordings.

Attempts to generate more flexible systems of facets for musical concepts and rules for their combination also point to potential richness of the classification of music phenomena. The complete revision of music schedules in DDC in the 1980s was undertaken with a facet analytical theory in mind (Sweeney 1990). The complete set of facets arrived at included: theory, elements, techniques, character, forms, executant, composer. The use of the base DDC music schedules for both notated music and books about music was accomplished by designing two different citation orders; the order for music itself was “executant, forms, character,” with the expectation (mirroring Dickenson) of the subsequent addition of a composer-facet symbol to create alphabetico-synthetic arrays of works under specific executants. One distinction that arose in implementation was to shift the citation order for vocal music to “forms, executants, character.” A thorough analysis of the rules for generating Library of Congress Subject Headings (LCSH) for music was outlined by Young (1998). At the time, the use of LCSH for music required catalogers to combine terms from simple lists of medium and form with indications of number to create otherwise uncontrolled headings. Based on the contents of the cataloged artifact (score, recording), the heading could either have form or medium as lead term, to which subdivisions for the other were added. Additional subdivisions for physical form, and occasionally period of composition, were allowed. Young’s detailed instructions cover every aspect of what we will later call “grammar” of music facets. A 2015 paper by Madalli, Balji and Sarangi applied ontological analytical concepts to the domain of music to generate a set of facets for a music ontology: these were “theory, person, instrument, kind, form, work.” Iseminger et al. (2017, 430) describe the evolution of thesauri from elements of the former LCSH, revealing potential thesauro-facet arrays for the usual suspects—topical headings, genre, form [and] medium. Meanwhile, new input from the music information retrieval community has pointed to the potential richness of music classification that takes into account a range from simple aboutness to more auditory concepts such as listener emotion—e.g., amazement, solemnity, tenderness, etc.—(Aljanaki, Wiering, and Veltkamp 2016), holistic user experience (Hu et al. 2015; Downie 2003)—e.g., boring, indifferent, hopeful, circumstance, etc., or task complexity—e.g., lyrics, translation, buy or download, etc. These IR approaches are particularly important for a classification of music that might be used for semantic web (SW) applications.

2.0 Grammar for faceting

Szostak (2017a) has described an approach to faceting that uses simple grammar to connect concepts in phenomenon-based classification. Szostak and Smiraglia (2019)
reported on the exploration of this wide variety of approaches to classifying music within the Basic Concepts Classification (BCC). Szostak (2019) explores the general advantages of a synthetic approach to classification, with particular attention to the classification of music.

Since the BCC has separate schedules of things (mostly nouns), relators (verbs and conjunctions), and properties (adjectives and adverbs), the subject headings formed in BCC tend to resemble sentence fragments. Though such subject headings may surprise those used to the ungrammatical format of most subject headings in the world, there are huge advantages to a grammatical approach. First, humans spend most of their lives thinking in sentences, and can thus more readily comprehend a subject heading that is expressed in grammatical format. Second, linguists appreciate that sentences clarify the meaning of terms within a sentence. A grammatical approach thus further decreases linguistic ambiguity (and BCC terminology is generally terminology that has broadly shared understandings across disciplines and groups).

Third, the nature of a work is the ideas it expresses (see Smiraglia 2001), and these are expressed in one or more sentences, often of the form X has effect N on Y. User queries are generally also expressed in a sentence. We can do a better job of guiding users to documents if we translate the user query into a sentence-like subject heading, and likewise translate the key idea of a work into a sentence-like subject heading. We at present go from a sentence-like query to an ungrammatical subject heading to a work best defined by a sentence.

Fourth, Szostak (2017b) showed how all of the facets identified within both the Bliss Classification and the Integrative Levels Classification can be interpreted as either distinct elements of a grammatical sentence, or as distinct schedules within the BCC classification of phenomena. The BCC thus clearly expresses all facets without needing to devote notational space to facet indicators. The classifier need not explicitly perform facet analysis, but can merely translate a sentence in a document description into BCC terminology. They can, if they wish, easily check to see which facets were addressed.

3.0 Methodology: The domain analysis clinic

The extension of the classification of music in the BCC is an essential part of the Digging into the Knowledge Graph research project,1 in which the classification of specific musical concepts rather than physical musical documents requires a larger embrace of musical phenomena. Here we describe specific work undertaken to define a larger array of musical phenomena, to generate a flexible but exhaustive system of facets, and to document the grammar of a facet analytical approach to classification of musical phenomena. In November 2019 a small group of experts in the classification of music was assembled at the Institute for Knowledge Organization and Structure, Inc. (IKOS) in Lake Oswego, Oregon (USA). The group constituted what IKOS has called a “domain analysis clinic” (DAC) on “the phenomena of music for classification.” The general outline of a DAC includes an invitation-only group, assigned “homework” to build an exhaustive corpus of relevant research from which segments of meta-analysis

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1 Digging Into the Knowledge Graph.  
are generated. When the group meets the meta-analysis is reviewed, synthesis is constructed, and follow-up assignments are fixed with the purpose of filling identified gaps in knowledge of the specific domain (Smiraglia 2019). Szostak and Smiraglia (2019) focused on how a synthetic approach within a general (universal) classification could facilitate classification along diverse dimensions such as the subject of a work, the composer’s intentions, and the intended audience. Participants in addition to Szostak and Smiraglia were Deborah Lee, Richard Griscom, J. Bradford Young and Joshua A. Henry. Specific details of the meta-analysis and the generation of facets are reported in Szostak et al. (forthcoming). What follows here is the general outline of the fleshing out of schedules of musical phenomena for the BCC.

4.0 Musical phenomena in faceted arrays

Upon review of the meta-analytical data, the group arrived at the following set of musical phenomena that should be developed or extended for the BCC:

- Character, occasion and function of the music
- Types, forms and genres of music
- Medium of performance
- Commercial elements of recorded music
- Format (arrangement, transcription, transformation, etc.)

In addition, consideration was given to traditionally relevant concepts such as the personal names of creative contributors (composers and librettists, but also sound editors, producers of performances, etc.) and to representations of place and time. BCC already allows synthesis of names, places and time designations.

4.1 Form, genre, etc.

It was decided to combine the elements identified above as “character, occasion, function, type, form and genre” into a single facet. The structure of this facet is to be based on the Library of Congress thesaurus for form and genre terms (LC Genre/Form Terms or LCGFT). LCGFT is maintained as linked open data (LOD) by the Library of Congress, with ongoing input from the active library community, including the Music Library Association (Library of Congress 2020):

“The Library of Congress Genre/Form Terms for Library and Archival Materials (LCGFT) is a thesaurus that describes what a work is versus what it is about. For instance, the subject heading Horror films, with appropriate subdivisions, would be assigned to a book about horror films. A cataloger assigning headings to the movie The Texas Chainsaw Massacre would also use Horror films, but it would be a genre/form term since the movie is a horror film, not a movie about horror films. The thesaurus combines both genres and forms. Form is defined as a characteristic of works with a particular format and/or purpose. A “short” is a particular form, for example, as is “animation.” Genre refers to categories of works that are characterized by similar plots, themes, settings, situations, and characters. Examples of genres are westerns and thrillers. In the term Horror films “horror” is the genre and “films” is the form.”

Some of the genres identified by the Library of Congress would be treated differently by the BCC. Most obviously, “humorous” is not really a distinct genre but a property that might be attributed to music from many different genres. One of the beauties of the synthetic approach taken by BCC is that terms from non-musical schedules can be used as necessary in the subject headings for works of music. “Humorous” is already a property within schedule Q of the BCC.
LCGFT is not music specific but the group easily extracted musical phenomena from the list, which can form the basis of a hierarchical array for BCC. LCGFT does include terms relating to styles and kinds of music.

A decision also was taken that occasions, functions, and character could be synthesized by adding terms from elsewhere in the BCC. The BCC already contains schedules that encompass various types of celebration, group, organization and time period. One schedule that we hope to expand upon is the schedule CR regarding religion. We intend to identify in more detail the various kinds or parts of religious services, e.g., baptism, offertory, etc.

4.2 Medium of performance

Traditionally the basis of most music classifications, medium of performance is obviously an essential facet. The BCC has imported the Hornbostel-Sachs instrument classification. This classification attempts global coverage, and provides a hierarchical structure grounded in the physical characteristics of instruments. However, the taxonomical terms used are not particularly directly the names of the “phenomena” of musical medium. For example, “flute” is embedded in a hierarchy of “aerophones,” and “piano” is under “pianoforte” embedded in a hierarchy of “chordophones.” The group urged incorporation of the Library of Congress Medium of Performance Thesaurus for Music (LCMPT), which like LCGFT is maintained in consultation with the Music Library Association (http://id.loc.gov/authorities/performanceMediums.html):

“The Library of Congress Medium of Performance Thesaurus (LCMPT) is a stand-alone vocabulary that provides terminology to describe the instruments, voices, etc., used in the performance of musical works … Authorized terms and references in LCMPT generally consist of single words and phrases, but parenthetical qualifiers are occasionally employed to differentiate among homonyms. All terms and references are in the singular form … (e.g., flute; saxophone ensemble; but Irish harp). The thesaurus has a few broadest terms as listed in the “Top Scheme Members” section. Each of the other terms is hierarchically subordinate to one or more of these terms and exhibits the class/class member relationship. Most of the authorized terms have Used For (UF) references for synonyms. Scope notes are also provided in many cases, and may describe the medium’s physical structure, the time period in which it was popular, and/or its geographic origin.”

For BCC, the group encouraged harmonization of the existing BCC schedule with LCMPT, and this task was assigned for work in early 2020.

4.3 Audiography

A new facet was outlined broadly with regard to input from the IR and SW communities. The general structure of the facet is to include:

Details of capture (i.e., where and when was a performance recorded)
Details of production and dissemination (release, music recording number, etc.)
Physical or digital format (soundtrack, single, compilation, track number, etc.)
User’s purpose: settle a bet, gift, etc.
Emotion invoked by the music

User studies have shown that the entities on this list are those often sought by people looking for music online. Perhaps the most controversial part of the group’s discussion, this facet was tasked for detailed explanation in early 2020. It is worth noting that details of capture, emotions and purposes likely can be synthesized from existing arrays in the BCC.
5.0 Conclusion: Toward the grammar of faceted music classification

Classificationists can usefully ask what sort of queries a user might have. We might reasonably expect that users will want to search for works from a particular genre, or about a particular subject (love songs, say), or with a particular purpose (revolutionary songs), or for a particular occasion (wedding songs), or with a particular melody (maybe to accompany a particular video), or to invoke a particular emotion. And think of a group of musicians that want to play together and thus seek works designed for the particular set of instruments that they play. The simple fact is that all of these searches are either difficult or impossible within existing approaches to music classification. Szostak and Smiraglia (2019) detailed how the synthetic approach of BCC facilitated the classification of works by subject, many occasions, multiple creators (for when a work is rearranged), and many aspects of culture. The present project seeks to develop new schedules that will further enhance the classification of music. Though challenges remain, we are confident that we can satisfy user queries much better than is possible at present.

References


