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# IN Harmony Card Sort/Task Scenario Study: Final Report

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## Acknowledgements

Thanks to Jenn Riley for her contribution to the data analysis and final report.

## **I. Executive Summary**

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The IN Harmony Card Sort and Task Scenario study was primarily designed to further identify how representative users distinguish between subject-related searches in order to refine the cataloging guidelines for IN Harmony sheet music. The study employed two techniques: task scenarios and card sort, each of which was designed to more specifically understand the following:

### **Task Scenario Activity**

- Which are the most appropriate controlled vocabularies to use in cataloging of these collections given the nature of the content: musical or cover art?
  - What is the frequency of overlap between user-specified terms and terms selected from controlled vocabularies?
  - Which controlled vocabulary was most often selected per task and across tasks?
  - How often did users specify or select lead-in terms versus the authorized form of a controlled term?

### **Card Sort Activity**

- How do user-derived categories inform metadata requirements and browse/search access points for the IN Harmony website?
- Do users indeed make a distinction among subject-related categories such as genre, form, style, instrumentation and so on?
  - If these distinctions are made, how do users distinguish between the more problematic categories of genre, form and style?

Listed above are the primary objectives; others were also established (see section 3 of this report).

The task scenario activity consisted of the following:

- Four 2-part task scenarios (see Appendix C) were administered to users
- The first part required participants to specify queries they would use to complete the task in written form [user specified terminology/queries]
- The second part required the selection of search terms from an alphabetized list comprised of controlled terms from Library of Congress Subject Headings (LCSH), Music Index Subject Headings List (Music Index), Répertoire International de Littérature Musicale (RILM) Thesaurus, Thesaurus of Graphic Materials: Subject Terms (TGM I), and Art & Architecture Thesaurus (AAT) [user selected terminology]

The card sort activity consisted of the following:

- Fifty-five subject-related terms (see Appendix D) were printed on index cards and given to participants to group and label the resulting groupings

More detailed information about the methodology can be found in section 5 of this report.

Nine participants were part of this study: 2 faculty members, 4 graduate students, one of which is a library assistant, 1 librarian and 2 K-12 music teachers. All but one perform music and nearly an equal number are interested in both cover art and musical content.

Overall, the task scenario and card sort activities revealed that searching for sheet music is not a straight-forward process; varied information needs and sheet music characteristics can complicate discovery. Following is a summary of what we learned as a result of this study:

- Structured metadata should facilitate faceted and syndetic (especially lead-in and narrower term relationships) discovery because:
  - Most participant specified queries were multi-term and referenced discrete categories such as genre and year
  - All nine participants stated the need for cross-references when card sorting; 6 of which created relatively complex hierarchies and poly-hierarchies during the sort process
- There is insignificant overlap between a user's specified terminology and the controlled vocabularies mentioned above, although there was significant conceptual overlap between the user-specified and user-selected terminology
- Controlled vocabularies under consideration revealed the most overlap with user terminology for topical descriptors, especially if they are broad in nature such as "Weddings" or "Transportation," and the least overlap with genre/form/style and instrumentation descriptors
- Partial matching or truncating of search terminology is expected as a discovery feature

Key recommendations include:

### **Cataloging Tool**

- Integrating syndetic structure of controlled vocabulary or supporting the addition of alternate terms (synonyms) to increase access
- Generate metadata in a modular fashion such as in discrete categories (e.g. genre/form, instrumentation, etc.) to facilitate in faceted discovery
- Consider utilizing Library of Congress Subject headings to describe musical content and TGM I to describe sheet music covers
- Consider describing cover art as many users in this study reported in almost equal interest in cover art to musical content

### **Website Delivery Functionality**

- Employ a faceted browse and fielded search so users can combine categories in a flexible way
- Support the ability to refine searches with the controlled vocabulary's inherent syndetic structure and/or refine search box on the results page

To see a complete list of the recommendations, see section 8 of this report.

## II. Introduction

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Indiana University (IU), the Indiana State Library (ISL), the Indiana State Museum (ISM), and the Indiana Historical Society (IHS) received a grant, effective October 1, 2004, from the Institute of Museum and Library Services (IMLS) to provide electronic access to Indiana-related sheet music from each of the institutions' collections. A cataloging tool especially designed to catalog sheet music will also be created for the project partners as well as for possible distribution to other interested institutions. The end result will be the IN Harmony: Sheet Music from Indiana website, which will contain approximately 10,000 digitized pieces of sheet music.

## III. Purpose of Study

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The Card Sort and Task Scenario usability study was designed as a two-part study in order to refine the metadata requirements and cataloging guidelines for the IN Harmony project. This study builds upon the findings from the Query Logs Analysis usability study<sup>1</sup> by leveraging the data collected in the logs study to further investigate, with the help of representative users of sheet music, unresolved questions that pertain to subject and content (music and cover art) access. Card sorting and task scenarios are the two usability techniques identified as reliable methods for gathering data about content organization, representation and retrieval, and formed the basis of this study.

Card sorting is a usability technique used to inform a range of design problems from content organization to metadata structures for optimal navigation and discovery. Participants are asked to group and label a set number of terms or concepts. These categories help reveal how content should be labeled, organized and represented. Task scenarios are another usability technique used to emulate a potential information need in order to elicit search queries and strategies from participating users. These search queries and strategies provide clues for optimal information retrieval guidelines and functionality. For a more detailed account of how the card sort and task scenario methodologies were used in this study, see the Methodology section of this report.

Following are the identified objectives for this study:

### Task Scenario Activity

- How do the queries provided by users compare to the types of queries encountered in the log data?
- Which are the most appropriate controlled vocabularies to use in cataloging of these collections given the nature of the content: musical or cover art?
  - What is the frequency of overlap between user-specified terms and terms selected from controlled vocabularies?
  - Which controlled vocabulary was most often selected per task and across tasks?
  - How often did users specify or select lead-in terms versus the authorized form of a controlled term?
- How do users search for musical content versus cover art? Do they utilize specific search strategies or unique descriptors when accessing one type of content over the other?

### Card Sort Activity

- How do user-derived categories inform metadata requirements and browse and search access points to the IN Harmony website?
- Do users indeed make a distinction among subject-related categories such as genre, form, style, instrumentation and so on?
  - If these distinctions are made, how do users distinguish between the more problematic categories of genre, form and style?

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<sup>1</sup> For the Query Logs Study final report, see:  
<http://www.dlib.indiana.edu/projects/inharmony/projectDoc/usability/logs/index.shtml>

### **Surveys and Debriefing Interviews**

- What are the general browsing and searching styles and characteristics across participating users?
- What is the user's background and experience with sheet music and how does this impact browsing and searching styles?
- How do users define "sheet music"?

## **IV. Background**

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The premise for the Card Sort and Task Scenarios usability study is based on the findings from the initial Query Logs study, which involved in-depth analysis of search logs generated by the Indiana University Sheet Music Collection and the UCLS Sheet Music Consortium websites. The UCLA website is comprised of sheet music records from several institutions including: University of California, Los Angeles, Indiana University, Johns Hopkins University, Duke University and the Library of Congress. A significant activity of the Query Logs study was to identify subject-related searches, which were later mapped to more specific, researcher-generated subject categories such as genre, form, instrumentation, etc. with the help of music domain expert and metadata librarian, Jenn Riley. In order to confirm whether users actually make subject-related distinctions, the card sort activity was designed. Participants grouped and categorized terms derived from the Query Logs study. The emerging categories and grouping characteristics will help determine necessary metadata elements for cataloging sheet music as well as provide useful browse categories and functionality for the collection website.

Another aspect of this study is to compare and map a user's natural language query with terms from various controlled vocabularies that may be integrated into the IN Harmony cataloging tool. Since the subject-related queries from the logs study have been identified, it is possible to automate a comparative analysis between all subject terms from the logs and controlled terms. However, the overhead of such an activity proved to be too cumbersome and would require significant amount quality checks. Instead, we designed the task scenario study to collect similar information. Participants provided their own search terms and selected terms off of controlled lists in response to task scenarios. Assessment of the resulting terminology and comparisons between the users' terms and the controlled terms will help us make controlled vocabulary recommendations that are more in line with the user's natural query language and search strategies.

## **V. Methodology**

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The IN Harmony Card Sort and Task Scenario study consisted of three components: completion of background questionnaire, task scenarios and a card sort activity. Sessions took place June 24 - June 29, 2005. A total of 9 sessions, lasting no more than an hour each, were held in the Library Electronic Text Resource Service (LETRS) conference room located in the Herman B Wells library at Indiana University, Bloomington. The sessions were audio recorded to supplement notes taken by the facilitator. This study was granted expedited review approval on June 3, 2005 by Indiana University's Human Subjects Committee (study # 05-10113).

Participants completed two forms before commencing with the task scenario activity: a study consent form (see Appendix A) and a background questionnaire (see Appendix B). Participants were then asked to complete 4 2-part task scenarios (see Appendix C) that represented typical sheet music information needs, followed by a brief discussion about the search terms and strategies they specified. Lastly, participants completed a card sort activity, which entailed categorizing 55 terms (see Appendix D).

After completing the activities, participants were compensated with a \$10.00 gift certificate to Barnes and Noble. They completed a standard gift acknowledgement form (see Appendix E) in exchange for the gift certificate for reimbursement purposes.

The entire study was scripted (see Appendix F) to ensure consistency across all participants.

A pilot session was conducted with a participant who has a relevant background in music. The pilot was administered like a regular session to uncover any problems with the instruments or activities. Because the pilot did not reveal any changes to the study, the pilot data was kept and analyzed along with the other participants.

### A. Instruments and Equipment

Instruments	Equipment
Consent Form (App A) Background Questionnaire (App B) Task Scenarios (App C) Card Sort Terms/Concepts (App D) Gift Acknowledgement Form (App E) Script (App F)	Olympus Digital Recorder

### B. Task Scenarios

Four 2-part task scenarios (see Appendix C) were designed to further examine the issue concerning subject access for sheet music with a particular focus in understanding which, if any, controlled vocabularies best match the participants' natural language and search strategies. The tasks are based on actual user queries to sheet music collection websites and reference questions posed to librarians who serve as gatekeepers to sheet music. The first part required participants to specify queries they would use to complete the task in written form on their own. A maximum number of queries per task was not mandated; the average number of specified queries by nine participants across all four tasks was 46.5. The second part of the task scenarios required the selection of search terms from an alphabetized list comprised of the terms from the following controlled vocabularies (CVs):

- Library of Congress Subject Headings (LCSH)<sup>2</sup>
- Music Index Subject Headings List (Music Index)<sup>3</sup>
- Répertoire International de Littérature Musicale (RILM) Thesaurus<sup>4</sup>
- Thesaurus of Graphic Materials: Subject Terms (TGM I)<sup>5</sup>
- Art & Architecture Thesaurus (AAT)<sup>6</sup>

Some subject heading lists and thesauri for music distinguish between terms describing works *about* music and terms describing music itself. LCSH, for example, contains headings for both, but any given heading would only be used for one or the other. Other vocabularies were developed for systems that only handled works about music or the musical works themselves. For these specialized vocabularies, such as the Music Index Subject Heading list and the RILM Thesaurus, the distinction is implicit. As the IN Harmony project will contain only musical works, and no texts about those works, we chose to widen the scope of potential vocabularies as far as possible and consider vocabularies intended for both purposes. However, interoperability with other music collections containing both types of materials must be considered if a vocabulary originally intended to describe works about music is chosen. TGM I and AAT were chosen primarily to address topical access to sheet music cover art.

In preparing for the second part of the task scenario activity, we found no obvious choices for vocabularies designed to describe works of music only. The Music Library Association-sponsored Music Thesaurus Project<sup>7</sup> is currently inactive, contains at this point only terms extracted from LCSH,

<sup>2</sup> <http://authorities.loc.gov/>

<sup>3</sup> [http://www.hppmusicindex.com/brs/subjects\\_a.jsp](http://www.hppmusicindex.com/brs/subjects_a.jsp)

<sup>4</sup> <http://www.rilm.org/>

<sup>5</sup> <http://www.loc.gov/rr/print/tgm1/>

<sup>6</sup> [http://www.getty.edu/research/conducting\\_research/vocabularies/aat/](http://www.getty.edu/research/conducting_research/vocabularies/aat/)

<sup>7</sup> <http://www.musiclibraryassoc.org/BCC/MTP/Mtp.html>

and is not publicly-accessible. The *Musaurus*<sup>8</sup>, a music thesaurus published in 1991, covering both music and works about music, and intended to overcome several identified limitations of LCSH, is limited in the vocabulary describing musical works and appears to have never been implemented in a production environment.

An equal representation of listed terms from each of these controlled vocabularies was not possible because of the varied nature of each task as well as the varied levels of inherent musical coverage provided by the CVs.<sup>9</sup> If participants selected a significant number of terms from the list, they were asked to indicate their top 5 choices. Participants were not allowed to consult the list of terms provided for part 2 of the task before specifying their own terms in part 1.

Participants were given approximately 5 minutes to complete each task. Upon completion of each task, a brief discussion ensued in order to compare terms specified and selected and clarify arising questions.

Following is a breakdown of the intended goal for each task including controlled vocabulary source:

Task	Terminology Designed to Test	Controlled Vocabulary Used for Part 2
T1	Genre/form/style [song played: Fats Waller's <i>Nobody but My Baby</i> ]	LCSH, Music Index, RILM and TGM I
T2	Topical, Genre/form/style and Instrumentation	AAT, LCSH, Music Index, RILM and TGM I
T3	Topical, Geographical Location, and Temporal	AAT, LCSH, Music Index and TGM I
T4	Topical [emphasis on cover art]	AAT, LCSH Music Index, RILM and TGM I

For a complete listing of both user-specified (part 1) and user-selected (part 2) controlled terms, see Appendix G.

### C. Card Sorting

Fifty-five subject-related terms (see Appendix D) were drawn from actual user queries collected in the Query Logs study. These queries were originally grouped as genre/form/style, geographic, instrumentation and topic<sup>10</sup> during the Query Logs analysis. In order to test these researcher-assigned categories, participants were asked to both group terms in meaningful ways and assign categories to these groupings. The terms were each printed on standard index cards. Cards referencing genre/form/style and instrumentation terms contained definitions on the flip side to assist participants while sorting. There were no requirements as to maximum number of user-defined groups or maximum number of terms per group; some user categories contained only one term, others multiple. Participants were provided with blank index cards and markers for labeling their categories.

Participants were given approximately 25 minutes to complete this activity. Upon completion of this activity, a brief discussion ensued in order to review groupings and clarify arising questions.

For a complete listing of the groupings and the user-assigned categories, see Appendix H.

<sup>8</sup> Harrold, Ann & Graham Lea. *Musaurus: A Music Thesaurus*. London: Music Press, 1991.

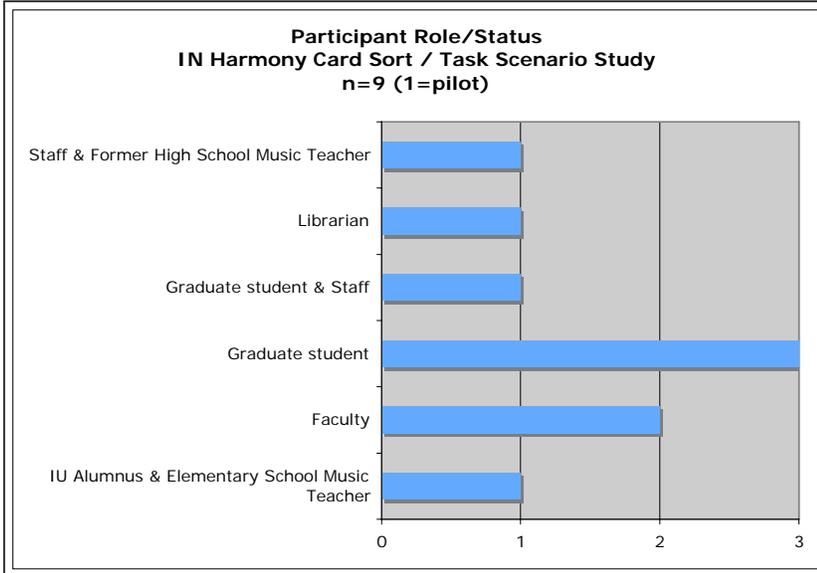
<sup>9</sup> This was taken into account during data analysis (see Findings section of this report).

<sup>10</sup> See pp. 9-10 of the Query Logs Analysis Final Report:

<http://www.dlib.indiana.edu/projects/inharmony/projectDoc/usability/logs/index.shtml>

## VI. Participants

The targeted user group for the study was rather broad: local area K-12 school music teachers, IU faculty and graduate students from various departments such as Music, Musicology, Ethnomusicology, Anthropology/Sociology, History and English, academic and public librarians and reference assistants who work with sheet music collections and amateur/professional musicians. Participants were pre-selected with the help of the Head of Reference and Public Services at the IU Lilly Library, Becky Cape, contacted via email. A total of nine people, of which one was a pilot user with a relevant background in music, participated in the usability session.



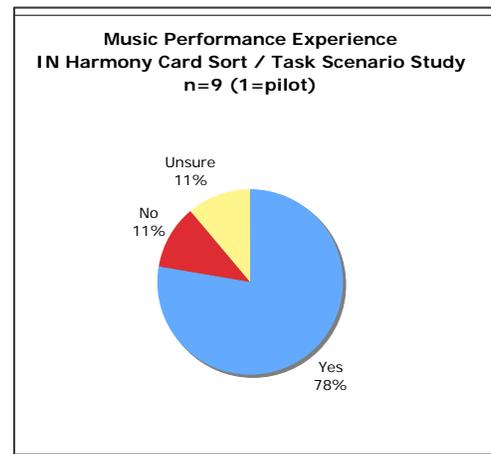
All the participants are Indiana University (IU) affiliates. Both of the K-12 music teachers received their music education degrees from IU. One of the teachers is an elementary school music teacher, the other is a retired high school music teacher, who remains active in teaching music by directing her church choir. Most of the graduate students are studying musicology with the exception of two who are library science (MLS) graduate students. One of the musicology students already has an MLS degree, the other is pursuing an MLS degree.

P#	Status	Professional/Academic Areas
P1	Faculty	Music Multimedia
P2	Graduate student	Musicology/Library Science
P3	Graduate student	Library & Info Science & Reference Asst
P4	Faculty	Musicology/Ethnomusicology/Telecom
P5	IU Alumnus	K-12 Music Teacher (elem)
P6	Graduate student	Musicology/Music (with MLS)
P7	Librarian	Public Services
P8	Staff	K-12 Music Teacher (high, former)
Pilot	Graduate student	Library & Info Science

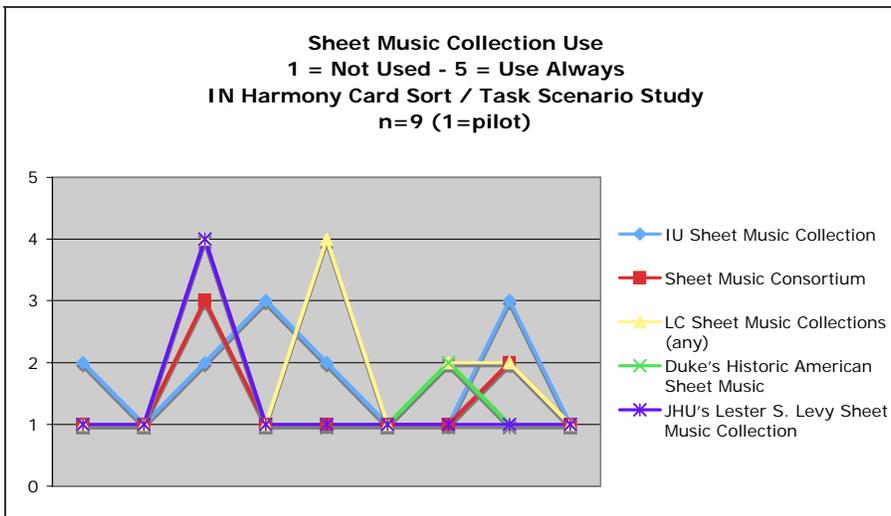
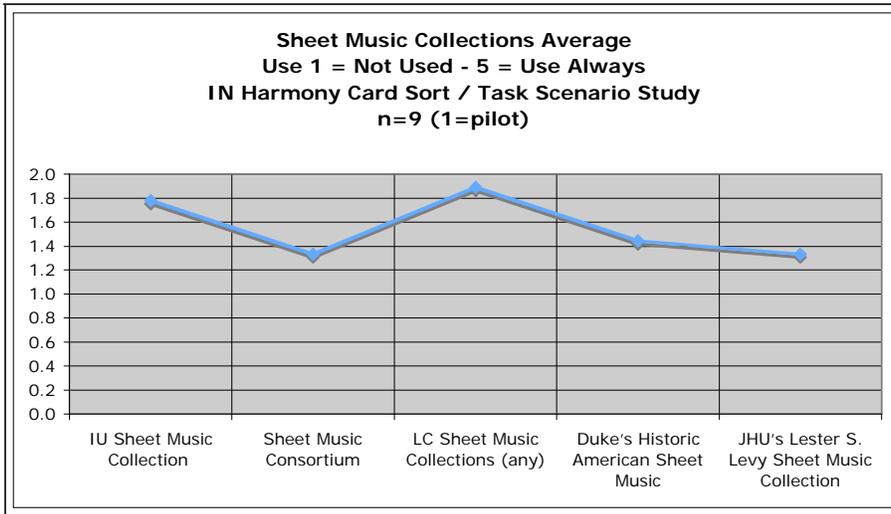
One of the faculty participants also volunteers as an extra-curricular high school orchestra instructor and private music teacher.

Of the nine participants, seven (78%) perform music, one (11%) doesn't and one (11%) did not specify. Most of the participants had an above-average understanding of musical terminology. The participant who did not specify their performance experience is a faculty member, who seemed quite knowledgeable about music performance.

Participants were asked to rate how often they use (1=not used; 5=use always) the following online sheet music collections: IU

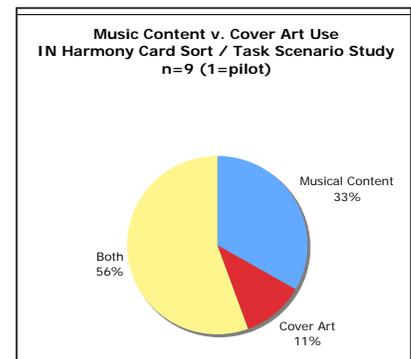


Sheet Music<sup>11</sup>, Sheet Music Consortium<sup>12</sup>, Library of Congress Sheet Music Collections<sup>13</sup>, Duke's Historic American Sheet Music<sup>14</sup> and Johns Hopkins's Lester S. Levy Sheet Music Collection<sup>15</sup>. On average, Library of Congress (LC) sheet music collections and the IU Sheet Music Collection were the most used though not by much.



Most collections were not consistently used, except for IU Sheet Music, which received ratings between 2 and 3 from all 9 participants. The Lester Levy and LC sheet music collections received a frequent use rating of 4 by two different participants. Participants listed other sheet music resources they consulted and these range from publisher's catalogs to commercial websites.

As a whole, participants expressed an interest in both the musical content and the cover art. Five out of nine (56%) stated they search for both as collectors/aficionados of sheet music and for research purposes. Three (33%) search for sheet music strictly for the musical content; two of these three are the K-12 teachers. The single user (11%) that is interested



<sup>11</sup> <http://www.dlib.indiana.edu/collections/sheetmusic/>

<sup>12</sup> <http://digital.library.ucla.edu/sheetmusic/>

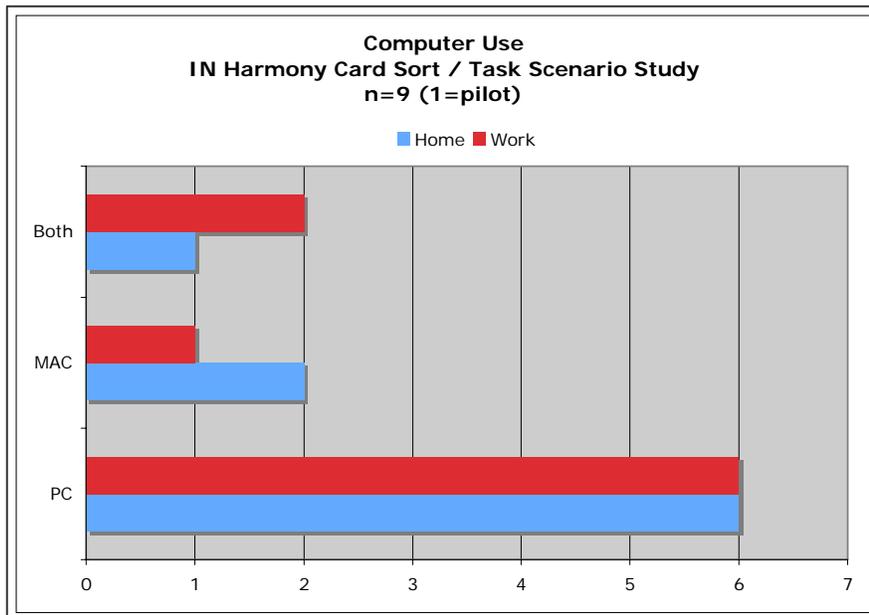
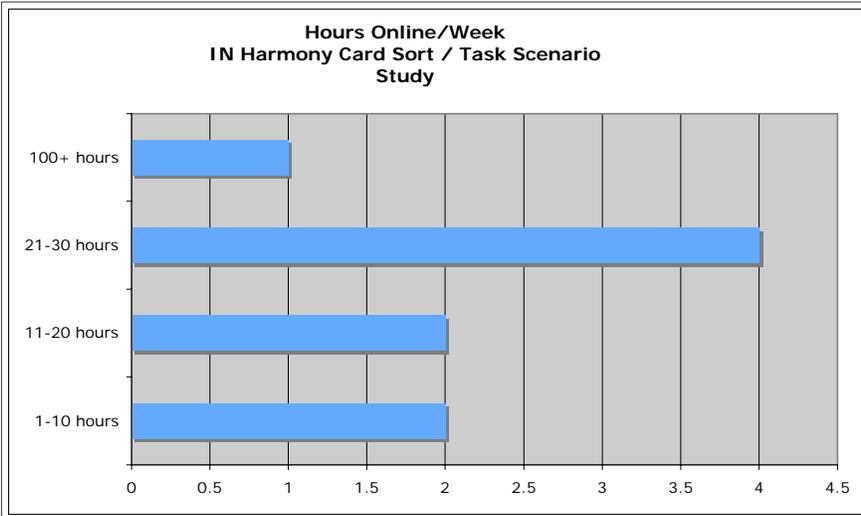
<sup>13</sup> <http://memory.loc.gov/ammem/browse/ListSome.php?format=Sheet+Music>

<sup>14</sup> <http://scriptorium.lib.duke.edu/sheetmusic/>

<sup>15</sup> <http://levysheetmusic.mse.jhu.edu/>

exclusively in cover art is responsible for creating sheet music exhibitions. Often, this participant selects sheet music to coincide with a certain theme being taught in a particular course (e.g. antebellum south).

Most participants spend a significant amount of time on computers at home and work and online for work, school or personal reasons. Many of them expressed in follow-up discussion that they prefer to consult music resources online, but feel that they don't have sufficient knowledge as to how to find relevant resources.



For the complete responses to the background questionnaire, see Appendix B.

## VII. Findings

Overall, the task scenario and card sort activities revealed that searching for sheet music is not a straight-forward process; varied information needs and sheet music characteristics can complicate discovery. Although the Query Logs study revealed a high percentage of known-item searching, it is clear, when working with actual users in a usability study, that unknown-item or thematic searching is similarly important. Of course, a major constraint with the logs study are the respective interfaces to the IU Sheet Music and UCLA Sheet Music

Consortium collections, which were designed to especially support known-item searching. Another constraint of logs study is that user-context (i.e. larger information seeking problem) is virtually indecipherable when conducting logs analysis since everything is reduced to basic queries. Even though the task and card sort activities were designed primarily to evaluate subject-related (unknown-item) access, participants revealed anecdotally that their real-life searches are often broad, more amorphous in nature.

All nine participants repeatedly expressed that cross-referencing of sheet music characteristics is essential. This notion of concepts belonging in multiple categories was emphasized by the card sort activity:

P1 – “. . . a lot of these go in several categories so . . . [we need] cross-relations. Everything has to be cross-referenced.”

P2 – “. . . we’re kind of dealing with genre and style here. That’s difficult thing for me to deal with. It’s difficult because I want to make cross-relationships . . .”

P5 – “. . . depending on what kind of music you teach and you perform, you think [and look for sheet music] in different ways.”

P8 – “Some of these go in different places. . . there are things that are cross-category, obviously.”

Others alluded to the need for cross-categorization as they grouped concepts; even though only one participant, P1, tackled the intellectual effort involved in creating poly-hierarchies in the card sort (see Appendix I).

P1 – “Rondo. . . [It goes] in both [dance and form]. . . Well, because it’s a dance, you can have them in a dance, but it’s really part of a sonata. It could be part of a movement of a symphony. It’s more of an arrangement. It could also be used to describe the form of just the piece. . .”

Others repeatedly encountered this obstacle, but in the end, decided to forego the effort of cross-categorizing during the card sort activity. Most; however, created hierarchies (6 out of 9 participants), and 2 of the 6 created hierarchies two or more levels deep. Clearly, these participants find categorical structures, so long as appropriate cross referencing is in place, important in understanding the content of a collection and retrieving that content.

When categorizing search terms, a number of users commented on the potential for using the categories to expand or refine a search. Several users perceived or imposed hierarchies when specifying their own queries or selecting terms from a controlled list. Often, participants would expect that searching a broad topic such as transportation would also yield results that related to trains, cars, etc. Narrowing was more often an expectation than broadening.

P1 – “I’d do a very broad [search] then I’d just continue to narrow it down. . . If I was searching under dance, I would never type any of these [Tango, Jig, etc.] because they would just come up.”

P4 – “I see *sacred vocal music* hopefully as a subset of *sacred music*. . . Well, hopefully transportation will take me to all these little subcategories [railroads]. I’d start with the broadest thing, and get a little more specific, but that’s just my strategy.”

A faceted approach to discovery could address the challenges of cross-relationships and expanding/refining searches identified by users in this study. Participants consistently combined various categories in order to meet an information need such as combining a name of a city and style/genre of music, e.g. New Orleans with Dixieland or Jazz with a time period. This trend was apparent in both the card sort and task scenario activities (see Appendix G for task scenario responses).

P3 – “. . . there’s going to be so much popular music . . . I could see chronological subdivisions or instrumental subdivisions.”

P4 – “So we’re looking at early twentieth century [sheet music category] and it’s kind of a progression: ragtime, jazz and elements of Dixieland. . . and then attached to all of these would be particular instruments for brass, clarinet, mandolin . . .”

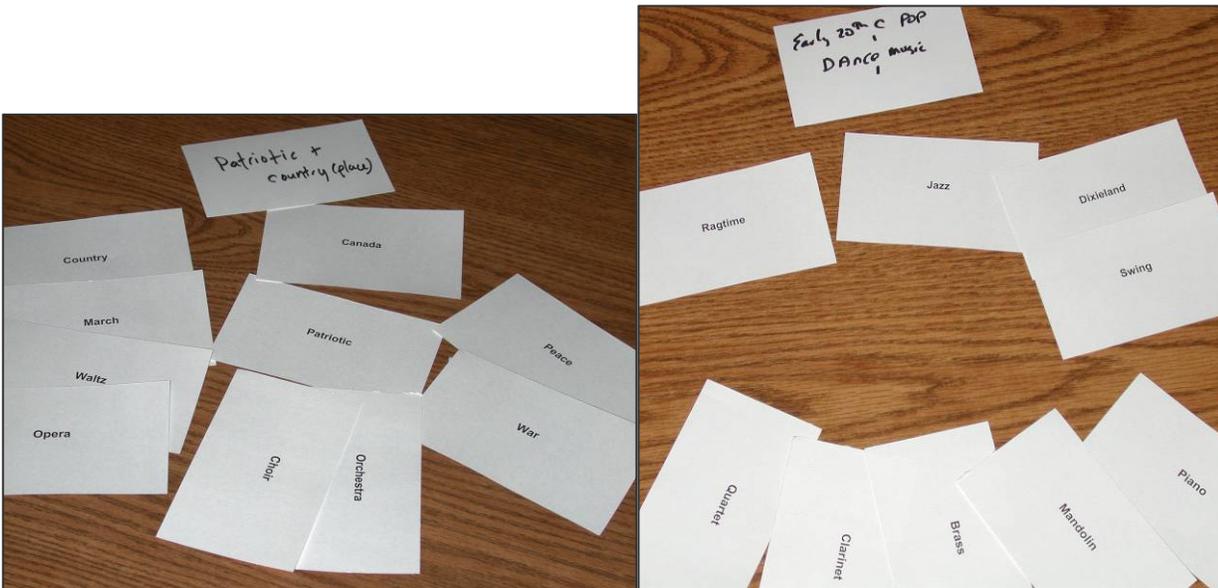
P6 – “A wedding march can also include instrumentation . . .”

Simply put, facets represent a major category or subdivision of a hierarchical controlled vocabulary. A facet typically contains homogenous class of concepts (e.g. Location as facet contains countries and cities). By combining distinct or complementary facets, users can either locate information that could reside in various categories or can dynamically generate relationships between categories for unexpected results.<sup>16</sup>

Two out of the nine participants, P4 and P8, took a very exploratory, radial, concept-map<sup>17</sup> approach to the task scenarios and the card sort activity, an approach well suited for faceted browsing or search. Both created broad groupings (see picture of P4’s card sort below), for example:

P4 – {Tejano, Polka, Voice, Love} {Mexican folk, vocal} {Patriotic, operas}

P8 – {Opera, Aria, Love, Serenade} {War, Peace, Patriotic, March}



\*Photos taken of P4’s card sort

Participant 4 explicitly stated that hypertext should be leveraged to support discovery of related, whether tightly or loosely related, themes or concepts. As P4 said, “it won’t work linearly.”

### A. Findings: Task Scenario Activity

No vocabulary describing musical content emerged clearly as the most appropriate for describing sheet music. Terms from LCSH greatly overlapped with the participants’ specified terms and were often selected from the controlled lists by all participants across all four tasks. However, LCSH terms were also most frequently represented in the controlled lists. For the description of the visual aspects of sheet music, our findings suggest that vocabularies that specifically cater to the topical description of visual resources such as AAT and TGM I are better equipped to handle cover art description.

We found user specified terminology was often a partial rather than exact match with the terminology from controlled vocabularies. This finding is in line with research that has shown a significant gap between users’ natural terminology and controlled terminology. Participants’ specified and selected

<sup>16</sup> The Charles W. Cushman Photograph Collection employs faceted browsing:  
<http://webappl.dlib.indiana.edu/cushman/projectInfo/techImplementation.jsp>.

<sup>17</sup> To learn more about concept maps, see: [http://en.wikipedia.org/wiki/Concept\\_map](http://en.wikipedia.org/wiki/Concept_map).

terms frequently were one word of a multi-word heading (e.g., “wedding” specified when the heading is “Wedding music”) or a term was specified in the singular when the heading appears in the plural (e.g. “march” when the specified heading is “Marches”). Participants’ specified and selected terms also frequently matched lead-in terms in the selected vocabularies, rather than authorized terms.

Most of the user-specified queries were multi-term and would reference different aspects such as topic and geographic location. These types of queries reveal a need for faceted browsing and searching of sheet music content.

Lastly, search strategies and terminology were not remarkably different for sheet music covers versus content. This could be attributed to the nature of the task (searching for stereotypical depictions of African Americans), to which users associated genres of sheet music. However, when specifying search terms for visual aspects or topical content of covers, users frequently included terminology intended to indicate the scope of their search. Participants therefore expect to specify whether they are searching for cover art versus content.

It should be noted that the data derived from the task scenario activity is both qualitative and quantitative in nature. Due to lack of constants in this study, namely the ability of participants to specify and select any number of queries in both parts of the task, and the fact that terms from the various controlled vocabularies were not presented in equal numbers in the term-selection phase, the numerical data is more suggestive than definitive.

#### **Task Scenarios 1-4, Part A & B: Overview**

In the task scenario study, participants were presented with a task and asked to specify in writing (part A) then select from a controlled list (part B) queries they would use to resolve the task scenario. User specified terms (part A) were collected and processed as follows:

- 1) all terms were normalized and mapped to pre-defined categories that emerged from the Query Logs Study (genre/form/style, instrumentation, etc.)
- 2) all terms were compared to the various controlled vocabularies selected per task for this study to determine level of overlap between the participant’s natural language and controlled terminology.

User selected terms (part B) were collected and processed as follows:

- 1) number of times a controlled term was selected per task
- 2) number of occurrences of selected controlled terms per vocabulary.

Various views of the processed data for part b provide helpful clues about the quality of the terms and the controlled vocabulary as a whole.

Due to the subjective nature of the data processing for part A of the tasks, guidelines were formulated to ensure consistency. Normalization of the terms relied on the guidelines established during the Query Logs study (see logs final report). User terms and controlled term overlap entailed the drafting of new guidelines:

- For each user-specified query, find the closest match in the lists of controlled vocabularies provided. Consider scenarios presented in case A & B:
  - case A) literal word-for-word match of a subject term
  - case B) would a subject search handled by a search engine capable of performing partial heading match (automatic truncation), match/retrieve the corresponding controlled heading? If yes, than there is a match (of some type; see match types). For example,

user types "honky tonk." The closest controlled term from LCSH is "honky tonk music." The search engine would be able to retrieve the records given its truncation ability.

- Indicate type of match:
  - n = no (It does not meet conditions set forth by case A or B. For instance, complex queries comprised of several terms including dates, names, etc. do not count.)
  - na = not applicable (Names, titles, and dates are automatically not applicable since they do not constitute subject headings).
  - y = yes (An exact, word-for-word match)
  - y = partial (Every word in the user specified query in column B appears in the controlled heading. The controlled heading could contain more terms.)
  - y = qual (It is the opposite of y=partial in that every word in the controlled heading appears in the user specified query. The user's query could contain extra terms we are labeling "qualifiers").
  - y = trunc (If the term is an shortened or root/base word that could be truncated. For example, march is the truncated form for marches).
- In CV "Term" column, type the headings that matches or most closely matches from each controlled vocabulary. If more than one heading, separate headings with a | symbol.
- In the CV "Refs" column, note if the mapped heading is a lead-in (U) term. For example, if the user's query is "jazz quartets", the LCSH authorized term is "jazz", but there's a lead-in term established as UF Jazz quartets. You should record the term that most closely matches, even if it is unauthorized, in this case, Jazz quartet, and note in the CV "Refs" column: U Jazz.

For part B, it should be noted that many of the controlled terms listed for selection for each task occur in more than one of the vocabularies under consideration. The data analysis will reflect this lack of exclusivity. There is also a distinction between number of times a term was uniquely selected and repeated selection instances. The latter indicates the term was counted only once per controlled vocabulary if selected by at least one participant where the former reveals the number of times the term was selected per controlled vocabulary across all users. This distinction helps to formulate a comparison between the vocabulary as whole and the respective terms themselves.

Two benchmarks were established for data analysis:

- Overlap between user-specified (part A) and controlled terminology is significant if it occurs within a vocabulary at least 33% of the time
- Specific terms chosen (part B) are significant if chosen by more than half of the total participants

All assessment for tasks part A and B was reviewed twice; once by the researcher, Michelle Dalmau, and then by a domain expert, Jenn Riley.

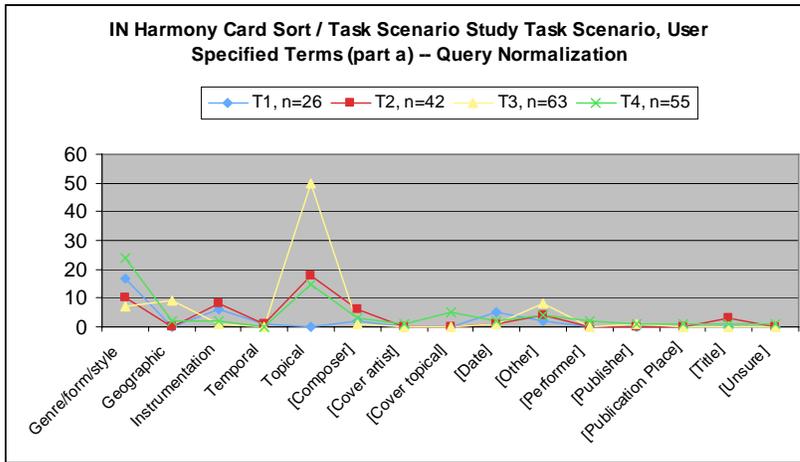


Figure 1: Terms/Queries Specified for Tasks 1-4 (part A) were mapped to pre-determined categories for analysis. Queries often included some combination of the categories shown above. Each category, whether it appeared alone or in combination, was counted.

**Task 1: Part A**

Task 1: *Listen to this tune [play song by Fats Waller, “Nobody But My Baby”]. You would like to find the sheet music for this song and for other similar songs by different composers.*

The purpose of this task was to ascertain how participants approach genre/form/style terminology. Twenty-six total terms were specified across all nine participants, as seen in Appendix G. Figure 1 above reveals that most of the queries specified for task 1a were of type genre/form/style (17/26). Many of the queries specified were multi-term and some included search strategies assuming system support, such as wildcarding, limiting to lyrics, etc. Of the multi-term queries, a recurring pattern was a genre/form/style term along with a date or time period; these two categories would serve as viable facets for discovery.

Each user-specified term was searched in LCSH, Music Index, and the RILM Thesaurus to determine what percentage of user terms matched controlled terms in each vocabulary. For task 1, user terms appeared as headings and lead-in terms in LCSH 36% of the time, although most of these were not exact matches. Overlap between user and controlled terminology was less than 33% for Music Index (32%) and RILM (32%).

	CV Source	Overlap Yes				Overlap No	Overlap N/A	Overlap % Yes	Overlap % No
		yes	yes partial	yes truncation	yes qualifier				
T1	LCSH	4	5	1	5	5	5	34%	26%
	LCSH Lead-In	0	0	1	0	0	0	2%	0%
	Music Index	5	0	1	6	7	5	27%	37%
	Music Index Lead-In	2	0	0	0	0	0	5%	0%
	RILM	3	0	1	6	7	5	23%	37%
	RILM Lead-in	3	1	0	0	0	0	9%	0%
<b>Total:</b>		<b>17</b>	<b>6</b>	<b>4</b>	<b>17</b>	<b>19</b>	<b>15</b>		

\*Overlap Yes is a total of all “yes” matches: yes (exact), partial, truncation and qualifier.

**Task 1: Part B**

Participants were presented with nineteen terms for this task, seven of which appear in more than one controlled vocabulary. The vocabularies represented were LCSH, Music Index, RILM and TGM I. Since terms appear in more than one vocabulary, and certain vocabularies contained a larger percentage

of terms in the list, the chart below provides an indication of the representation per vocabulary in the list of controlled terms presented to the participants. LCSH (74%) and Music Index (47%) make up a bulk of the terms. One of the terms, Rags, is not part of any of the controlled vocabularies, but it is a term that appears often in the sheet music websites query logs and one that participants wrote down when completing part A of task 1.

T1	CV Source	List Representation %
	LCSH	63%
	LCSH Lead-In	11%
	Music Index	47%
	<i>Music Index Lead-In</i>	0%
	RILM	26%
	<i>RILM Lead-in</i>	0%
	TGM I	5%
	<i>TGM I Lead-In</i>	0%
	None	5%

Of the four terms selected by more than half of the participants, three of them are from LCSH. The other term, Ragtime, appears in Music Index and RILM, and is a partial match to the LCSH heading Ragtime music. Thirteen of the nineteen terms presented for this task were selected at least once.

Task	# Selected	%	CV Term
T1	0	0%	African Americans--Music
T1	1	11%	African-American music
T1	0	0%	Black music
T1	0	0%	Blues (music)
T1	1	11%	Dixieland music
T1	0	0%	Foxtrots
T1	3	33%	Instrumental music
T1	4	44%	Jazz
T1	0	0%	Marches
T1	0	0%	Music, instrumental
T1	6	67%	Piano music (jazz)
T1	9	100%	Piano music (Ragtime)
T1	2	22%	Popular music
T1	3	33%	Popular music -- Sheet music
T1	1	11%	Popular songs
T1	1	11%	Quicksteps
T1	4	44%	Rags
T1	7	78%	Ragtime
T1	8	89%	Ragtime music
<b>Total:</b>	<b>50</b>		<b>19 Total Terms on List</b>

The chart below provides a per-vocabulary assessment of terms selected. LCSH and the Music Index were most heavily represented on the list (63% and 47% of available terms, respectively), and both of these vocabularies were repeatedly selected by users. Eight Music Index terms of the nine available were selected, and RILM, which was underrepresented on the list, had four out of five terms selected. TGM I contains one term match, "Jazz," but it is not an appropriate vocabulary for music description.

“Rags,” which is not found in any of the controlled vocabulary either as an authorized term or a lead-in term, was selected four times.

	CV Source	CV Terms Uniquely Selected	CV Total Terms	CV Terms Uniquely Selected/Total	Selected Instances (Pilot-P9) #	Selected Instances (Pilot-P9) %
T1	LCSH	8	12	67%	34	42%
	LCSH Lead-In	1	2	50%	1	1%
	Music Index	8	9	89%	22	27%
	<i>Music Index Lead-In</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
	RILM	4	5	80%	16	20%
	<i>RILM Lead-in</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
	TGM I	1	1	100%	4	5%
	<i>TGM I Lead-In</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
	None	1	1	100%	4	5%
<b>Total:</b>					<b>81</b>	

\*CV Terms that were selected at least once per CV by at least one participant are considered unique selections. Selection Instances indicate the repeated selection of terms per CV across all users.

## Task 2: Part A

Task 2: *You are helping a friend select music for her church wedding ceremony.*

The purpose of this task was to ascertain how participants approach topical, genre/form/style and instrumentation terminology. Forty-two total search terms were specified across all nine participants, as seen in Appendix G. Figure 1 above reveals that most of the queries specified for task 2a, were of type topical (18/42), genre/form/style (10/42) and instrumentation (8/42).

Like Task 1, many of the queries specified contained multiple terms. Of the multi-term queries, a recurring pattern was genre/form/style along with a topical term; two categories that also would serve as viable facets for discovery.

Each user specified term was searched in LCSH, Music Index and RILM to determine what percentage of user terms matched controlled terms in each vocabulary. For task 2, user terms appeared as headings and lead-in terms in LCSH 36% of the time, and unlike Task 1, most of these were exact matches between the user-specified and controlled terms. User terms also matched Music Index terminology 34% of the time, of which a significant number appear as exact matches. Overlap between user and controlled terminology was less than 33% for RILM (31%).

	CV Source	Overlap Yes				Overlap No	Overlap N/A	Overlap % Yes	Overlap % No
		yes	yes partial	yes truncation	yes qualifier				
T2	LCSH	9	2	4	5	6	12	30%	25%
	LCSH Lead-In	2	1	0	1	0	0	6%	0%
	Music Index	6	7	2	6	8	12	32%	33%
	Music Index Lead-In	0	0	0	1	0	0	2%	0%
	RILM	6	2	0	5	10	12	20%	42%
	RILM Lead-in	3	0	2	2	0	0	11%	0%
	<b>Total:</b>	<b>26</b>	<b>12</b>	<b>8</b>	<b>20</b>	<b>24</b>	<b>36</b>	<b>100%</b>	<b>100%</b>

\*Overlap Yes is a total of all “yes” matches: yes (exact), partial, truncation and qualifier.

**Task 2: Part B**

Participants were presented with eighteen terms for this task, twelve of which appear in more than one controlled vocabulary: AAT, LCSH, Music Index, RILM and TGM I. Since terms appear in more than one vocabulary, and certain vocabularies contained a larger percentage of terms in the list, the chart below provides an indication of the representation per vocabulary in the list of controlled terms presented to the participants. LCSH (78%) and Music Index (61%) make up the bulk of the terms.

	CV Source	List Representation %
T2	AAT	17%
	AAT Lead-In	6%
	LCSH	56%
	LCSH Lead-In	22%
	Music Index	50%
	Music Index Lead-In	11%
	RILM	39%
	RILM Lead-in	17%
	TGMI	11%
	TGMI Lead-In	0%

Of the two terms selected by more than half of the participants, both are from LCSH. One of the terms, “Weddings,” is also found in three other vocabularies (RILM, TGM and AAT). All of the terms presented for this task were selected at least once.

Task	# Selected	%	CV Term
T2	2	22%	Cantatas, sacred
T2	1	11%	Cathedral music
T2	2	22%	Ceremonies
T2	2	22%	Christian music, Contemporary
T2	2	22%	Church music
T2	1	11%	Contemporary Christian music
T2	1	11%	Hymn
T2	2	22%	Hymns
T2	1	11%	Incidental music
T2	2	22%	Music, instrumental
T2	1	11%	Piano music
T2	3	33%	Religious music
T2	1	11%	Religious music -- Christian
T2	2	22%	Sacred music
T2	3	33%	Sacred vocal music
T2	1	11%	Vocal music
T2	7	78%	Wedding music
T2	6	67%	Weddings
<b>Total:</b>	<b>40</b>		<b>18 Total Terms on List</b>

The chart below provides a per-vocabulary assessment. Like Task 1, LCSH, Music Index and RILM were the vocabularies repeatedly selected. This corresponds to their relative representation of terms on the list (56%, 50% and 39%). These vocabularies, however, better handle genre/form/description and instrumentation description. Topical terms are well handled across all the vocabularies except Music Index and RILM. Every term on this list was selected by at least one user. This does not mean that all the vocabularies are equally appropriate for this task, but that some of the terminology found within each vocabulary is adequate.

	CV Source	CV Terms Uniquely Selected	CV Total Terms	CV Terms Uniquely Selected/Total	Selected Instances (Pilot-P9) #	Selected Instances (Pilot-P9) %
	T2	AAT	3	3	100%	10
AAT Lead-In		1	1	100%	1	1%
LCSH		10	10	100%	26	27%
LCSH Lead-In		4	4	100%	9	9%
Music Index		9	9	100%	20	21%
Music Index Lead-In		2	2	100%	4	4%
RILM		7	7	100%	16	17%
RILM Lead-in		3	3	100%	10	10%
TGMI		2	2	100%	0	0%
TGMI Lead-In		n/a	n/a	n/a	n/a	n/a

\*CV Terms that were selected at least once per CV by at least one participant are considered unique selections. Selection Instances indicate the repeated selection of terms per CV across all users.

### Task 3: Part A

Task 3: *You are interested in the historical development of transportation in the United States. You decide that popular music might provide helpful clues.*

The purpose of this task was to ascertain how participants approach topical, geographical and temporal terminology. Sixty-three total terms were specified across all nine participants. Figure 1 above reveals that most of the queries specified for task 3a, were of type topical (50/63), geographical (9/63) and genre/form/style (7/63); no temporal terms were specified by users.

Like the previous tasks, several of the queries specified (see Appendix G) contained multiple terms. Of the multi-term queries, a recurring pattern was a topical term along with a geographic term; two categories that would serve as viable facets for discovery.

Each user specified term was searched in LCSH and TGM I to determine what percentage of user terms matched controlled terms in each vocabulary. For task 3, user terms appeared as headings and lead-in terms in LCSH 58% of the time. User terms also matched TGM I terminology 42% of the time, of which a significant number appear as exact matches. Both vocabularies met the 33% or greater overlap benchmark established for this study. Although most of terms specified by participants were topical in nature and well-handled by both vocabularies, an unexpected number of genre/form/style terms were also specified, and TGM I is not designed to handle such terms. This could also explain why LCSH reveals a greater overlap (aside from LCSH terms comprising the bulk of the list).

	CV Source	Overlap Yes				Overlap No	Overlap N/A	Overlap % Yes	Overlap % No
		yes	yes partial	yes truncation	yes qualifier				
T3	LCSH	13	9	9	0	11	6	40%	33%
	LCSH Lead-In	5	3	6	0	0	0	18%	0%
	TGMI	11	1	7	1	22	7	26%	67%
	TGMI Lead-In	6	0	6	0	0	0	16%	0%
<b>Total:</b>		<b>35</b>	<b>13</b>	<b>28</b>	<b>1</b>	<b>33</b>	<b>13</b>		

\*Overlap Yes is a total of all "yes" matches: yes (exact), partial, truncation and qualifier.

**Task 3: Part B**

Participants were presented with twenty-one terms for this task, fourteen of which appear in more than one controlled vocabulary: AAT, LCSH, Music Index and TGM I. Since terms appear in more than one vocabulary, and certain vocabularies contained a larger percentage of terms in the list, the chart below provides an indication of the representation per vocabulary in the list of controlled terms presented to the participants. LCSH (76%) and TGM I (58%) make up a bulk of the terms.

	CV Source	List Representation %
T3	AAT	33%
	<i>AAT Lead-In</i>	0%
	LCSH	71%
	LCSH Lead-In	5%
	Music Index	10%
	<i>Music Index Lead-In</i>	0%
	RILM	0%
	<i>RILM Lead-in</i>	0%
	TGMI	48%
	TGMI Lead-In	10%

Of the seven terms selected by more than half of the participants, six are from LCSH. Two of these six are also found in AAT and TGM I. The other term, “trains,” is a lead-in term in TGM I. Twenty of the twenty-one terms presented for this task were selected at least once.

Task	# Selected	%	CV Term
T3	4	44%	Airplanes
T3	6	67%	Airplanes -- Songs and music
T3	1	11%	Automobile driving
T3	3	33%	Automobiles
T3	6	67%	Automobiles -- Songs and music
T3	3	33%	Bridges
T3	4	44%	Bridges -- Songs and music
T3	4	44%	Cars
T3	3	33%	Cars (Automobiles)
T3	3	33%	Covered wagons
T3	0	0%	Flying
T3	5	56%	Flying -- Songs and music
T3	2	22%	Motor vehicles
T3	1	11%	Planes
T3	4	44%	Railroads
T3	6	67%	Railroads -- Songs and music
T3	2	22%	Sea songs
T3	6	67%	Steamboats
T3	6	67%	Trains
T3	7	78%	Transportation
T3	2	22%	Wagon trains
<b>Total:</b>	<b>78</b>		<b>21 Total Terms on List</b>

The chart below provides a per-vocabulary assessment. For this task, most of the terms presented from AAT, LCSH, Music Index and TGM I were selected 100% of the time by at least one participant. This agreement shows that all of these vocabularies handle topical description fairly well.

T3	CV Source	CV Terms Uniquely Selected	CV Total Terms	CV Terms Uniquely Selected/Total	Selected Instances (Pilot-P9) #	Selected Instances (Pilot-P9) %
	AAT	7	7	100%	28	21%
AAT Lead-In	n/a	n/a	n/a	n/a	n/a	
LCSH	15	15	100%	61	46%	
LCSH Lead-In	1	1	100%	3	2%	
Music Index	2	2	100%	6	5%	
Music Index Lead-In	n/a	n/a	n/a	n/a	n/a	
TGMI	9	10	90%	33	25%	
TGMI Lead-In	2	2	100%	2	2%	

\*CV Terms that were selected at least once per CV by at least one participant are considered unique selections. Selection Instances indicate the repeated selection of terms per CV across all users.

#### Task 4: Part A

Task 4: *You are conducting research related to African-American stereotypes and popular music. You are interested in the depiction of African Americans on sheet music covers.*

The purpose of this task was to ascertain how participants approach topical searching of sheet music covers. Fifty-six total terms were specified across all nine participants. Figure 1 above reveals that most of the queries specified for task 4a, were of type genre/form/style (24/56) and topical (15/56).

Unlike the previous tasks, few queries provided for this task referenced multiple facets. This could be attributed to the fact that this task was one of the more challenging for most participants.

Each user specified term was searched in AAT, LCSH and TGM I to determine what percentage of user terms matched controlled terms in each vocabulary. For task 4, user terms appeared as headings and lead-in terms in LCSH 58% of the time. Overlap between user and controlled terminology was less than 33% for AAT (19%) and TGM I (22%). Although most of terms specified by participants were topical in nature and generally well-handled by all three vocabularies, like task 3, an unexpected number of genre/form/style terms were also specified, and AAT and TGM I were not designed to handle such terms. If genre/form/style terms are removed from the count, both AAT and TGM I would surpass the 33% established benchmark for desired overlap.

T4	CV Source	Overlap Yes				Overlap No	Overlap N/A	Overlap % Yes	Overlap % No
		yes	yes partial	yes truncation	yes qualifier				
AAT	5	0	2	0	34	12	15%	46%	
AAT Lead-In	2	0	0	0	0	0	4%	0%	
LCSH	8	9	8	0	14	15	54%	19%	
LCSH Lead-In	0	0	2	0	0	0	4%	0%	
TGMI	0	1	6	0	26	14	15%	35%	
TGMI Lead-In	1	0	2	0	0	0	7%	0%	
<b>Total:</b>	<b>16</b>	<b>10</b>	<b>20</b>	<b>0</b>	<b>74</b>	<b>41</b>			

\*Overlap Yes is a total of all "yes" matches: yes (exact), partial, truncation and qualifier.

**Task 4: Part B**

Participants were presented with twenty-nine terms for this task, thirteen of which appear in more than one controlled vocabulary: AAT, LCSH, Music Index, RILM and TGM I. Since terms appear in more than one vocabulary, and certain vocabularies contained a larger percentage of terms in the list, the chart below provides an indication of the representation per vocabulary in the list of controlled terms presented to the participants. LCSH (76%) and AAT (48%) make up a bulk of the terms.

	CV Source	List Representation %
T4	AAT	24%
	AAT Lead-In	24%
	LCSH	48%
	LCSH Lead-In	28%
	Music Index	3%
	Music Index Lead-In	3%
	RILM	3%
	<i>RILM Lead-in</i>	0%
	TGMI	14%
	TGMI Lead-In	14%

Of the two terms selected by more than half of the participants, only one is found in both LCSH and TGM I. The other is a lead-in term in TGM I. The task 4 list is unique in that it is comprised of terms that are both descriptive in nature and conceptual or interpretive. Both of these were included to gain information on whether both types of terms should be used while cataloging sheet music collections. Two of the nine participants, both of whom have MLS degrees, noted the mixture of descriptive and interpretative terms. Both advised against interpretative cataloging stating that interpretation should be up to the user.

Task	Selected	%	CV Terms Presented to Users
T4	3	33%	African American
T4	3	33%	African American minstrel shows
T4	2	22%	African Americans
T4	2	22%	African Americans in popular culture
T4	0	0%	African Americans--Race identity
T4	4	44%	Afro-American
T4	2	22%	Art and race
T4	0	0%	Black (style)
T4	2	22%	Black Americans
T4	5	56%	Blackface entertainers
T4	1	11%	Caricature
T4	1	11%	Colored people (United States)
T4	1	11%	Ethnic attitudes in art
T4	1	11%	Ethnic identity
T4	2	22%	Ethnic stereotypes
T4	2	22%	Ethnicity
T4	3	33%	Harlem Renaissance
T4	0	0%	Identity
T4	0	0%	Identity (Psychology) in art
T4	4	44%	Minstrels
T4	4	44%	Negro
T4	2	22%	Negro minstrel shows

T4	1	11%	Negro Renaissance
T4	1	11%	Negroes
T4	0	0%	Parody
T4	1	11%	Race (concept)
T4	0	0%	Satire
T4	6	67%	Racial stereotypes
T4	4	44%	Stereotype (Psychology) in art
<b>Total:</b>			<b>29 Total Terms on List</b>

The chart below provides a per-vocabulary assessment. For this task, terms presented from Music Index and TGM I were selected 100% of the time by at least one participant even though these two vocabularies were the least represented. Interestingly, a significant number of terms selected for this task are lead-in terms from AAT and LCSH (86% and 88% respectively). Listed lead-in terms from the other vocabularies were also repeatedly selected across all participants. AAT and TGM I both rated relatively highly for this task.

	CV Source	CV Terms Uniquely Selected	CV Total Terms	CV Terms Uniquely Selected/Total	Selected Instances (Pilot-P9) #	Selected Instances (Pilot-P9) %
T4	AAT	4	7	57%	9	9%
	AAT Lead-In	6	7	86%	14	15%
	LCSH	10	14	71%	26	27%
	LCSH Lead-In	7	8	88%	14	15%
	Music Index	1	1	100%	2	2%
	Music Index Lead-In	1	1	100%	1	1%
	RILM	1	1	100%	4	4%
	<i>RILM Lead-in</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>
	TGMI	4	4	100%	13	14%
	TGMI Lead-In	4	4	100%	13	14%
	<b>Total:</b>				<b>96</b>	

## B. Findings: Card Sort Activity

The most significant finding of the card sort activity was the need for structure and established relationships in order to optimize discovery. Since all nine participants voiced the need for cross-relationships, it is of no surprise that 8 of 9 participants created hierarchies, poly-hierarchies and concept-map categories with their sorted cards.

A primary goal for the card sort was to understand if participants indeed make distinctions between genre, form, and style. Users in this study did indeed make distinctions between genre and form (genre and style were mostly considered synonymous), but there was not consensus amongst the participants as to which terms belonged in genre, and which belonged in form. Also, the least music-savvy participant, P7, made it clear that someone not formally educated in music will have trouble making a distinction between the two, and such novice music people make up a significant portion of the IN Harmony user base.

The need for faceted discovery also surfaced in the card sort activity. Several users created an “Ethnic” category that often included genre/form terms (e.g., Habanera) and geographic location terms (e.g., Cuba). If this is true for all “ethnic” music, then a faceted browse or search will be able to yield meaningful results for users.

The “Subject” category (topical in nature) proved to be an unexpected finding. Participants made explicit distinctions within that category that ranged from general (catchall) to conceptual (thematic, ideas, etc.). Further distinctions within these categories were often made such as “Holidays and Events” or “Transportation.” A controlled vocabulary with a robust syndetic structure with manageable and meaningful broader term relationships could generate useful subject hierarchies for enhanced discovery. However, we know from previous usability studies and published research<sup>18</sup> that creating relevant broader categories or facets often requires manual intervention on behalf of the subject specialists.

### **Card Sort Activity: Overview**

Participants were presented with a 55 terms selected from actual queries found in the Query Logs study. Each term was printed on an index card, and users were instructed to group cards into categories meaningful to them (no limits to the number of cards per group) and then label their groupings. The card sort data was processed as follows: 1) groupings and categorizations were documented for each participant; 2) the participants’ categories were sorted by the researcher in order to determine overlap, if any, between categories; and 3) categories were normalized (see Appendix I in order to make distinctions between as well as collapse participant-specified categories.

As with the task scenarios, assessment for the card sort was reviewed twice; once by the researcher, Michelle Dalmau, and by a domain expert, Jenn Riley.

### **Card Sort: Resulting Categorizations**

The card sort activity was well-received by the participants of this study, and in turn, the participants generated some rather interesting findings. On the whole, participants revealed that structured metadata is important in aiding the discovery process. Six out of nine participants created hierarchies when grouping concepts, two of which included poly-hierarchies and another two of which included categorization more than two levels deep. Two other participants generated more of an associative structure, similar to concept maps, for relating thematic groupings of concepts. All participants stressed the need for cross-relationships between categories to enhance discovery.

One of the main goals for this study is to understand how users of sheet music might categorize characteristics of sheet music, including the more ambiguous categories of genre, form and style (see Appendix I for a breakdown of normalized categories). Most participants agreed on two out of the six normalized categories: instruments and places/location. While general agreement amongst participants is evident in the instrument category, two issues did arise: the placement of voice and distinction between ensembles (quartet, orchestra, etc.) and single instruments. Participants who were not comfortable placing voice under “instrument” either created a super-category labeled “Performance Medium” or created a sub-category “Voice” or “Vocal.” Ensembles were handled similarly by either creating a super- or sub-category for ensemble.

The other participant-generated categories were not so clear-cut. For instance, the data revealed no distinction between genre and style; both category labels were used synonymously and genre was used as a label more often than style. Participants tended to distinguish between form and genre, but this was not a unanimous distinction. A considerable amount of overlap of terms (indicated by the cells highlighted in yellow below) exists between the user categories form and genre. Also, participants with less formal musical training did not note such a rigid distinction.

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<sup>18</sup> See the Flamenco faceted metadata project for more information: <http://bailando.sims.berkeley.edu/flamenco-pubs.html>

Form, n=8 participants		
Term	# of Participants	Frequency in Category
March	8	100%
Canon	7	88%
Etude	7	88%
Habanera	7	88%
Jig	7	88%
Rondo	7	88%
Sonata	7	88%
Tango	7	88%
Waltz	7	88%
Barcarolle	6	75%
Serenade	6	75%
Polka	5	63%
Opera	4	50%
Aria	2	25%
Hymns	2	25%
Psalm Tunes	2	25%
Swing	2	25%
Orchestra	1	13%
Quartet	1	13%
Tejano	1	13%

Genre, n=9 participants		
Term	# of Participants	Frequency in Category
Dixieland	9	100%
Jazz	9	100%
Ragtime	9	100%
Country	8	89%
Swing	7	78%
Mexican Folk	3	33%
Tejano	3	33%
Patriotic	2	22%
Polka	2	22%
Tango	2	22%
Voice	2	22%
Aria	1	11%
Brass	1	11%
Clarinet	1	11%
Habanera	1	11%
Hymns	1	11%
Jig	1	11%
Mandolin	1	11%
Opera	1	11%
Piano	1	11%
Quartet	1	11%
Waltz	1	11%

“Ethnic” was another category that was frequently identified by study participants. Five out of eight participants generated categories that encompass ethnic, world, or cultural music. Often the ethnic categories included terms for both genres of music (e.g. Tejano) and geographic location (e.g. Mexico). Lastly, the varied nature of the “subject” category (referring to topical subjects) was a significant finding. We did not expect participants to make explicit distinctions within the larger topical scope. Users created subcategories of the following types (labels provided by the researcher): subject – general (serves as a catchall), subject – situational (represents events), subject – conceptual (represent themes, ideas, etc.) and subject – tangible (represent objects – sheet: music about trains). Within these distinctions, several participants established specific categories such as Holidays and Events or Transportation.

### C. Findings: Summary

In summary, we learned the following from conducting the task scenario and card sort usability study:

- Structured metadata should facilitate faceted and syndetic (especially lead-in and narrower term relationships) discovery
- There is insignificant overlap between a user’s specified terminology and the controlled vocabularies under consideration, although there was significant conceptual overlap between the user-specified and user-selected terminology
- Controlled vocabularies under consideration revealed the most overlap with user terminology for topical descriptors, especially if they are broad in nature such as “Weddings” or “Transportation,” and the least overlap with genre/form/style and instrumentation descriptors
- Partial matching or truncating of search terminology is expected as a discovery feature

## VIII. Recommendations

<b>CATALOGING TOOL</b>	
<b>Findings</b>	<b>Recommendations</b>
Users often specify or select lead-in terminology when conducting search (especially singular v. plural forms)	<ul style="list-style-type: none"> <li>• Support the addition of alternate terms to increase access</li> <li>• –OR–</li> <li>• Integrate syndetic structure of the controlled vocabulary(ies)</li> </ul>
Describe content in terms of discrete pre-defined categories that can later be used for faceted discovery	<ul style="list-style-type: none"> <li>• Metadata “container” element for each of the following: instrument, geographic location, genre/form, subject/topical</li> <li>• Investigate the issue of “Ethnic” music: How prevalent is it in our sheet music collections; and can it be sufficiently described by assigning genre/form and geographical location?</li> </ul>
LCSH headings, though overly represented in the task scenario study, were repeatedly selected by participants	<ul style="list-style-type: none"> <li>• Consider utilizing LCSH to describe musical content</li> <li>• Investigate if the LCSH “syndetic” structure can be utilized to automatic generate relationships between assigned headings</li> </ul>
Though LCSH headings were repeatedly chosen, participants voiced during the interviews that subdivisions and certain qualifiers were confusing. One particular free-floating subdivision, “songs and music,” was thought to be unnecessary and redundant by half the users, and specific and to the point by others.	<ul style="list-style-type: none"> <li>• Minimize the use of free-floating subdivisions</li> </ul>
Participants reported in the background questionnaire that cover art is equally sought as musical content.	<ul style="list-style-type: none"> <li>• Consider describing at the very least the descriptive/topical elements of the sheet music covers</li> </ul>
TGM I and AAT topical headings are better suited for describing visual content than LCSH.	<ul style="list-style-type: none"> <li>• Determine level of cover art cataloging. If topical access only, use TGM I (and even LCSH may suffice). If additional information is to be recorded, assess if AAT is a better option.</li> </ul>

<b>WEBSITE DELIVERY FUNCTIONALITY</b>	
<b>Findings</b>	<b>Recommendations</b>
Users expect search engine to automatically truncate search terms (especially singular forms of words)	<ul style="list-style-type: none"> <li>• Support partial matching of authorized headings</li> <li>• Support wildcard/truncation searching</li> </ul>
Users expect structured metadata in order to: a) continually refine/narrow their search results, b) automatically retrieve all narrower terms when conducting a search, and c) search all synonyms	<ul style="list-style-type: none"> <li>• Integrate some syndetic structure when browsing and searching</li> <li>• Provide a refine search box to search within results set</li> </ul>
Users often generated complex queries that include discrete categories or facets	<ul style="list-style-type: none"> <li>• Employ a faceted browse and fielded search so users can combine categories in a flexible and dynamic manner</li> </ul>
Year/date ranges were often used to constrain a query	<ul style="list-style-type: none"> <li>• Allow for year range searches</li> </ul>
There is no cross-user clear distinction between genre, form, and style	<ul style="list-style-type: none"> <li>• Label in interface should be: genre/form</li> </ul>
Users still hold a broad and varied definition of sheet music although these participants were overall savvy sheet music users.	<ul style="list-style-type: none"> <li>• Convey IN Harmony’s definition of sheet music</li> <li>• Convey the strengths of the partners’ collections by including a “highlights” or “features” section</li> </ul>

## **Appendix A: Consent Form**

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### **Indiana University – Bloomington Informed Consent Statement IN Harmony: Sheet Music from Indiana – Card Sort and Task-Based Evaluation for Subject Terms**

You are invited to participate in a research study. The purpose of this study is to learn how you search for sheet music.

#### **Information**

The Digital Library Program recently received a grant to digitize over 10,000 pieces of Indiana-related sheet music from various state institutions for online access. We are in the early design stages and would benefit from your feedback as potential users of this or similar sheet music collections.

If you chose to participate, you will complete a card sort and task scenario activity that will help us understand how you search for sheet music. The card sort activity entails the grouping and categorization of 50-60 items, and the task scenario entails assigning and selecting search terms in response to four task scenarios. You will also be asked to complete a short background questionnaire.

The session will last no more than 1 hour. The facilitator and a note-taker will be present during the session. While you are completing the activities, you will be encouraged to talk through your thoughts and your actions as you complete the activities. You are also encouraged to ask questions at any time.

The questionnaire and session notes are anonymous; personal identification information, such as your name, will not be referenced on these documents. The questionnaire and sessions notes will only be seen by the researchers and will be used strictly for the development of the *IN Harmony* cataloging tool and website.

#### **Risks**

There are no known risks associated with this kind of study. However, at any time, you are free to take a break during the session.

#### **Benefits**

Your participation will inform the design of the *IN Harmony* website, and in turn, will benefit all future users of this online sheet music collection. In addition, the findings from this study may assist other digital library programs that are designing online sheet music collections.

#### **Confidentiality**

All the data collected will be done so in an anonymous fashion. The questionnaire you will complete will be identified with a generic identifier, e.g. P1, not your name or any other unique identifier such as Social Security Number.

The session notes will not refer to you by name or by any other identifying characteristic, but they will contain your responses, comments, suggestions and noted observations that arise as you complete the activities. All the data collected will only be reviewed by the researchers of this study. The data, including the questionnaires and session notes, will be kept in restricted access until completion of the *IN Harmony* project in September 2008, at which time they will be destroyed.

Initials: \_\_\_\_\_

#### **Compensation**

You will receive a gift certificate to a local bookstore worth \$10.00 for participating in this study. If you chose to forego participation after reading this consent form, you will not be compensated.

**Contact**

If you have questions at any time about this study or the procedures, feel free to ask. You may also contact the researcher, Michelle Dalmau, at the Digital Library Program, Indiana University-Wells Library, 1320 East 10th Street, Room E-170, Bloomington, Indiana 47405, 812-855-1261 and mdalmau@indiana.edu.

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact the office for the Indiana University Bloomington Human Subjects Committee, Carmichael Center L03, 530 E. Kirkwood Ave., Bloomington, IN 47408, 812/855-3067, by e-mail at iub\_hsc@indiana.edu.

**Participation**

Your participation in this study is voluntary; you may refuse to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be returned to you or destroyed.

**Consent**

I have read this form and received a copy of it. I have had all my questions answered to my satisfaction. I agree to take part in this study.

Participant's signature \_\_\_\_\_ Date \_\_\_\_\_

Investigator's signature \_\_\_\_\_ Date \_\_\_\_\_

Last revised: May 31, 2005

**Appendix B: Background Questionnaire, Questions and Answers**

q1	IU Status: Faculty Graduate Student Librarian Staff Alumnus Non-IU
q1a	If Non-IU, please specify:
q1b	Area(s) of study, expertise or professional practice:
q2	What type of computer do you use? (circle all that apply)
q2a	at home: PC MAC
q2b	at work: PC MAC
q3	About how many hours a week do you spend online (WWW, email, etc)
q4	Which browser(s) do you most commonly use? (e.g. IE 6.0, NS 4.7, Firefox, Safari)
q5	Please indicate with an "x" how frequently you use the following sheet music collections:
q5.1	Indiana University Sheet Music Collection
q5.2	Sheet Music Consortium
q5.3	Library of Congress Sheet Music Collections (any)
q5.4	Duke's Historic American Sheet Music
q5.5	Johns Hopkins' Lester S. Levy Sheet Music Collection
q5a	List other sheet music resources you use:
q6	Describe why and how you typically use sheet music in your teaching, research or performance.
q7	Are you more interested in sheet music cover art or in the musical content? Please explain under which circumstances you would search for either cover art or content.
q7a	How do you search for cover art (e.g. list example search terms or summarize searching style/approach)?
q7b	How do you search for musical content (e.g. list example search terms or summarize searching style/approach)?
q8	How do you define "sheet music"?
q9	Verbal question: Do you have a music background?

P#	q1	q1a	q1b	q2a	q2b	q3	q4	q5.1	q5.2	q5.3	q5.4	q5.5
pilot	Graduate student		Library and Information Science	PC	PC	25	Firefox	2	1	1	1	1
p1	Faculty		Music Multimedia	MAC	MAC	100	Safari   Mozilla   Firefox	1	1	1	1	1
p2	Graduate student		Library science   Musicology   Violin Performance   Physical anthropology	PC	PC	30	IE	2	3	4	4	4
p3	Graduate student   Staff		Libraries, Special collections (rare books and manuscripts)	PC	PC	30	Firefox   IE	3	1	1	1	1
p4	Faculty		Musicology   Ethnomusicology   Telecommunications   Website Development   Digital Archives	PC   MAC	PC   MAC	20	IE   Safari   NS 7	2	1	4	1	1

p5	Alumnus   Music Teacher	Elementary School Music Teacher	Music Education	PC	PC	20		1	1	1	1	1
p6	Graduate student		Musicology (MA). I also hold an MLS from another university and have worked as a librarian elsewhere.	PC	PC   MAC	8	Firefox	1	1	2	2	1
p7	Librarian			PC	PC	30	IE 6.0   Firefox	3	2	2	1	1
p8	Staff		10 years elementary school music teacher in public school. Work with church children's and adult choir.	MAC	PC	9	IE   Safari	1	1	1	1	1

P#	q5a	q6	q7	q7a	q7b	q8	q9
pilot		I play music	Musical content. I would look for a specific piece or type of music to play (i.e. chamber music)		Instrumentation (i.e. string quartet, piano trio, viola), composer name, title	Music written in some form	yes, played in high school orchestra
p1	Usually printed catalog	I don't use sheet music here but for private lessons or research for conductors.	I like cover art! Content obviously is important as well. Sometimes musical quotes.	Google? Don't really have an approach.	Usually keyword	A printed extraction for a particular part from a score -- can represent whole collections/ensembles and chamber ensembles.	yes, plays music and is/was a music teachers
p2	UC Santa Barbara has a page of links I go to sometimes. I think there is a university in Tennessee that has a popular music site I have gone to. Another university (Baylor?) has a site specifically for ethnic sheet music.	I have taken a course in Jewish-American identity in 20th century music that required me to find examples of Irish-Jewish interaction in sheet music. I collect E.T. Paull music and various other pieces I find interesting. I have also searched sheet music related databases to find complete names of composers/lyricists when I used to catalog 78 rpm discs.	I collect E.T. Paull music for the cover art. For my Jewish identity class I needed to look at both cover art and sheet music for ethnic markers.	Author/lyricist, distinctive word in title, publisher (if known), sometimes subject (particularly for ethnic-related music)	Same as above. Actually in regard to 7a above I usually do not use the title word approach.	Popular music published for people to take home and sing/play on their pianos. Classical music published for performance purposes.	yes, plays music
p3	n/a	I serve as a liaison with IUDLP for their digitizing projects; some occasional troubleshooting (e.g. with metadata, Access database -- for	Both. The socio/historical/cultural content of cover art is frequently interesting. As a (very) amateur player of mandolin, the music has some interest too.	I've never really searched for cover art. I simply browse through the pieces.	Usually simple title, author or lyric searches.	A music printed for performance purposes.	yes

		some sheet music pieces).					
p4	University of Michigan, Brown University	Analysis of advertisements, construction of musical representations of "ethnic" communities -> pseudo "indiana music", analysis of vaudeville traditions, analysis of "nationalistic" music in terms of all musical elements, lyrics and advertisements.	Equally interested for research purposed -- seeing (cover art) how a specific song was marketed.	Content themes, names of composers I'm familiar with, genre names of publishing houses, era, performance medium	composer, performance medium, genre	Individual pieces of published music, marketed as a single item rather than collection for a defined performance medium (e.g. piano) by an identified composer, produced by an identified publisher	unsure
p5	Publisher's catalog, Internet resources	If there is a published song that fits a unit I am teaching or fits into a program theme, then I would use sheet music for those purposes.	Content would be the most important aspect for me. If the students or I are studying/performing a particular theme or historical era, then I would search for content in the sheet music.	n/a	I generally search under content area or historical period. Sometimes it is just looking through a bin of sheet music, looking at catalogs, asking colleagues	Sheet music is a published work meant for one voice (solo, sometimes two) that is popular. It generally has a cover sheet of art work.	yes, plays music and is/was a music teachers
p6	The Cook's library collection, the Lilly's library collection	In research I have to constantly refer to scores as they form the basis for most of my papers. I work on Variations2 for my job and must refer to scores to error check my work.	Musical content is primary; I would search for that to work on a paper. One could do an interesting study of iconography but I'll probably leave that to someone else.	Major items portrayed [i.e. piano*, violin*, wom?n*, dancer*]	Title, keywords in text if applicable, opus (or similar standardized number)	Ask John Cage! But seriously, to me in a sense it can encompass anything in printed score form but generally excludes the gesamtausgabe (big scholarly editions).	yes
p7	Occasionally I check commercial sites, but I don't recall the names.	I usually use it for its visual qualities, either for exhibitions or presentations to class groups. Its subject qualities are also useful in these contexts.	Cover art - exhibitions or presentations to class groups, i.e. minstrels for antebellum history class.	Sometimes by performer if music is associated with a particular style; otherwise by thematic keywords.	Only basic terms -- waltz, march, etc. My musical knowledge is minimal.	Music in unbound format of 1-3 folded folio sheets - possibly staples but basically designed to lay flat.	no, does not play music and has little formal musical knowledge
p8	My own collection; Singing Indiana History: a musical resource guide for teachers by Martha Riley from Purdue	I use it for performance and appropriate lessons.	Both. The cover art is unique for the period in which it was published. The musical content is also unique.	I never have.	I've only searched for publisher websites and large music distributor websites.	One song in a paper publication that is not an octavo or choral work.	yes, plays music and is/was a music teachers

## Appendix C: Task Scenarios

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1. Listen to this tune [play song]. You would like to find the sheet music for this song and for other similar songs by different composers.
  - a. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you use** to find what you are looking for?
  - b. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you chose from the attached list** to find what you are looking for?
2. You are helping a friend select music for her church wedding ceremony.
  - a. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you use** to find what you are looking for?
  - b. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you chose from the attached list** to find what you are looking for?
3. You are interested in the historical development of transportation in the United States. You decide that popular music might provide helpful clues.
  - a. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you use** to find what you are looking for?
  - b. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you chose from the attached list** to find what you are looking for?
4. You are conducting research related to African-American stereotypes and popular music. You are interested in the depiction of African Americans on sheet music covers.
  - a. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you use** to find what you are looking for?
  - b. Assuming you have access to a sheet music database that contains online versions of printed music, which search terms **would you chose from the attached list** to find what you are looking for?

**Appendix D: Card Sort Terms**

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ID#	Card Terms		
1	Alabama	31	Orchestra
2	Aria	32	Organ
3	Barcarolle	33	Patriotic
4	Bicycles	34	Peace
5	Brass	35	Piano
6	Bridges	36	Polka
7	Buffalo	37	Psalm tunes
8	Canada	38	Quartet
9	Canon	39	Ragtime
10	Chattanooga	40	Railroads
11	Choir	41	Rondo
12	Christmas	42	Serenade
13	Clarinet	43	Sonata
14	Country	44	Swing
15	Cuba	45	Tango
16	Dixieland	46	Tejano
17	Etude	47	Trains
18	Guitar	48	Turkish
19	Habanera	49	Viola
20	Hymns	50	Violin
21	Indiana	51	Voice
22	Italian	52	Waltz
23	Jazz	53	War
24	Jig	54	Wedding
25	Love	55	Yiddish
26	Mandolin		
27	March		
28	Memphis		
29	Mexican folk		
30	Opera		

**Appendix E: Gift Acknowledgement Form**

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**Gift Acknowledgment Form for IN Harmony: Sheet Music from Indiana –  
Card Sort and Task-Based Evaluation for Subject Terms**

By signing below, I certify that I participated in a usability evaluation for the *IN Harmony: Sheet Music from Indiana* project sponsored by the Indiana University Digital Library Program and received a Barnes & Noble gift certificate in the amount of \$10.00 in exchange for my participation.

\*Social security number is mandatory and is used for tax purposes/reporting by IU FMS Tax Department. This form will be turned into the library budget staff, and will remain in a confidential, secure place until filing.

Signature: \_\_\_\_\_

Print name: \_\_\_\_\_

SSN: \_\_\_\_\_

Date: \_\_\_\_\_

Email: \_\_\_\_\_

## **Appendix F: Script**

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[Introductions & Orientation (bathrooms, cafeteria, etc.)]

[Review of Consent Form : Questions ?]

[Overview of IN Harmony Project]

Indiana University (IU), the Indiana State Library (ISL), the Indiana State Museum (ISM), and the Indiana Historical Society (IHS) have received a grant from the Institute of Museum and Library Services (IMLS) to provide electronic access to Indiana-related sheet music from each of the institutions' collections. Approximately 10,000 pieces of sheet music will be available online as a result of this grant activity.

[Overview of Activities]

You will complete a brief background questionnaire and two activities: a card sort and task scenario. While completing the activities, I will encourage you to talk-aloud. We are interested to know what you are thinking as you work through the tasks. You can ask me questions at any time. [Note taker's name] will be taking notes. You are free to look at [his/her] notes after each activity.

[Questions?]

[Administer Background Questionnaire]

Please take a moment to complete a brief background questionnaire. If you are unsure about any of the questions, feel free to ask.

[Administer Task Scenario Activity / Debrief]

You will provide search terms for four task scenarios. I will show you one scenario at a time. For each scenario, you will list your own search terms and then select search terms from several lists. After each scenario, we will compare your search terms to the ones selected.

- From the terms you circled, **select the 5 you** would most likely use in a search.
- Task 4: How would you distinguish between cover and musical content when searching?

[Administer Card Sort Activity / Debrief]

You will receive approximately 50-60 index cards. Each card will contain a term, and the flipside will contain a definition of that term. Please sort the cards into groups meaningful to you. Each group may contain any number of cards. After you sort the cards, please give each group a label. Use one of these blank index cards to create labels for your piles.

You can create a "don't know" pile if you are unable to group certain piles. We can review the items in that pile towards the end of this activity.

[Wrap up: Final Questions/Comments, Gift Disbursement, Complete Gift Acknowledgment Form]

**Appendix G: Task Scenarios – User Specified (part a) and User Selected (part b) Terms**

\*Cells highlighted in gray denote a user-modification to the specified or selected terms. Bold-faced “x” reveal top 5 choices per participant.

Task 1a -- User Specified	pilot	p1	p2	p3	p4	p5	p6	p7	p8
Boogie-Woogie	x			x					
Honky Tonk	x	x		x					
Jazz	x								
Jazz (early)		x							
Jazz (lite)					x				
Jazz - 1900-1920			x						
Jazz piano (early)				x					
Joplin (perhaps)			x						
Keyboard		x							
Midi file					x				
Piano	x	x					x	x	
Piano music			x						x
Piano rag						x			
Piano solo								x	
Popular music					x				
Rag		x				x	x		
Ragtime			x	x			x	x	x
Scott Joplin - links						x			
Solo piano					x				
Swing	x								
Year designation: 1890-1925							x		
20-30s Jazz						x			
40-50s Published rag						x			
40-50s solo piano jazz/rag						x			
20-30s solo piano jazz/rag						x			
20th century (early to mid)				x	x				

Task 1b - User Selected (CV)	pilot	p1	p2	p3	p4	p5	p6	p7	p8
African Americans -- Music									
African-American music			x						
Black music									
Blues									
Blues (Music)									
Dixieland music								x	
Foxtrots									
Instrumental music		x	x		x				
Jazz	x	x	x			x			
Marches									
Music, instrumental									
Piano music (jazz)	x	x	x	x		x		x	
Piano music (Ragtime)	x	x	x	x	x	x	x	x	x
Popular music			x		x				
Popular music -- Sheet music					x		x		x
Popular songs					x				
Quicksteps						x			

Rags	x					x	x		x
Ragtime	x	x	x		x		x	x	x
Ragtime music	x	x	x	x	x	x		x	x

Task 2a -- User Specified	pilot	p1	p2	p3	p4	p5	p6	p7	p8
baroque			x						
ceremonial			x						
chorale							x		
church wedding music		x							
church wedding composers		x							
church wedding processional/recessional		x							
classical wedding music						x			
collections - wedding music									x
commitment								x	
composer's name					x		x	x	
friendship								x	
genre - religions (which one?)					x				
here comes the bride				x					
hymn	x								
instrumental					x				
instrumental & vocal					x				
length					x				
love								x	
lyrics					x				
march			x				x		
marriage			x				x	x	
Mendelssohn		x							
nuptials			x						
organ	x								
organ music									x
Pachabel (or Canon in D)				x					
piano trio	x								
popular wedding music						x			
procession/al			x						
Purcell			x						
sacred wedding music						x			
secular wedding music						x			
sheet music									x
string trios				x					
time frame (era)					x				
title					x				
quartet	x								
vocal music									x
Wagner			x						
wedding	x		x		x		x	x	
wedding march				x					
wedding music				x		x			x

Task 2b - User Selected (CV)	pilot	p1	p2	p3	p4	p5	p6	p7	p8
------------------------------	-------	----	----	----	----	----	----	----	----

Cantatas, sacred	x				x				
Cathedral music						x			
Ceremonies			x		x				
Christian music, Contemporary					x	x			
Church music					x			x	
Contemporary Christian music						x			
Hymn	x								
Hymns					x			x	
Incidental music	x								
Music, instrumental			x		x				
Piano music	x								
Religious music	x				x			x	
Religious music -- Christian					x				
Sacred music					x				x
Sacred vocal music					x	x			x
Vocal music									x
Wedding music	x	x	x	x	x	x			x
Weddings			x	x	x		x	x	x

Task 3a -- User Specified	pilot	p1	p2	p3	p4	p5	p6	p7	p8
(limit by year)	x				x				
airplane songs						x			
airplanes			x	x					
auto(mobile)	x						x		
automobiles			x	x					
bicycle							x		
bicycles			x	x				x	
blimps			x						
(travel by) boat songs in america						x			
boat	x								
boats			x					x	
buggy								x	
canals					x			x	
carriage							x		
car songs in america						x			
car	x						x		
cars								x	
composer					x				
Detroit (hub)		x							
early american transportation songs						x			
highway							x		
highways					x			x	
horse							x		
horses								x	
instrumental					x				
jazz					x				
locomotives								x	
machines			x						
march					x				

music - historical USA									x
music - transportation									x
music - trains									x
music - cars (or automobiles)									x
music - trucks									x
music - walking									x
music - horses									x
mule							x		
New Orleans (hub)		x							
popular					x				
popular music transportation		x							
popular music history & transportation		x							
publishing house					x				
ragtime					x				
railroad	x						x		
railway							x		
rivers									x
roads									x
ships			x						x
St. Louis (hub)		x							
steamships					x				
tracks									x
train songs in america						x			
train	x						x		
trains				x	x				x
transportation	x		x						
transportation songs						x			
traveling music									x
truck					x		x		
vaudeville									
vehicles			x						x
wagon train songs in america									
wagon							x		
wagons									x

Task 3b - User Selected (CV)	pilot	p1	p2	p3	p4	p5	p6	p7	p8
Airplanes	x		x				x	x	
Airplanes -- Songs and music		x	x	x	x	x			x
Automobile driving									x
Automobiles	x		x				x		
Automobiles -- Songs and music		x	x	x	x	x			x
Bridges	x		x				x		
Bridges -- Songs and music		x	x		x				x
Cars	x		x					x	x
Cars (Automobiles)			x				x		x
Covered wagons						x		x	x
Flying									
Flying -- Songs and music		x		x	x	x			x
Motor vehicles			x				x		

Planes			x						
Railroads	x		x				x	x	
Railroads -- Songs and music		x	x	x	x	x			x
Sea songs		x							x
Steamboats	x		x	x			x	x	x
Trains	x		x	x			x	x	x
Transportation	x		x	x	x	x		x	x
Wagon trains						x			x
Covered (wagons)	x						x		

Task 4a -- User Specified	pilot	p1	p2	p3	p4	p5	p6	p7	p8
Africa*							x		
African american sheet music covers						x			
African american stereotypes in music						x			
African american	x	x	x					x	
African-Americans and stereotypes				x					
Afro-american			x					x	
Album cover		x							
Black	x						x		
Blackface				x					
Black music			x						
Blues			x				x		x
Cakewalk							x		
Composers			x						
Coon (stereotype invoked)					x				
Coon/Blackface minstrel songs					x				
Cover artist					x				
Dixieland		x	x					x	
Early (1920-1940s) songs from musicals/African american cover art						x			
Early minstrel music - cover art era (publishing date)					x				
ethnic			x						
female (content)					x				
Gospel (+ other terms)							x		
Hip-hop		x					x		
Holler (+ other terms)							x		
Image (jpg)		x							
Images	x								
Jazz		x	x				x	x	
Jazz - instrumental									x
Jazz - vocal									x
Louis Armstrong									x
Male (content)					x				
Minstrel								x	
Minstrel show								x	
Motown		x							
Negro	x						x		
Picture		x							

Plantation (musical theme)					x				
Publication place					x				
Popular music			x						
Publishers			x						
Ragtime									x
Ragtime music							x		
Rap		x					x		
Scott Joplin									x
Sheet music covers - African american						x			
Slave	x						x		
Slaves			x						
Slavery			x						
The south								x	
Spirituals									x
S. Foster (composer)					x				
Thelonious Monk									x
Titles			x						
Uncle Tom				x					
Vaudeville					x				

Task 4b - User Selected (CV)	pilot	p1	p2	p3	p4	p5	p6	p7	p8
African American	x						x	x	
African American minstrel shows		x	x			x			
African Americans			x	x					
African Americans in popular culture		x			x				
African Americans--Race identity									
Afro-American	x		x				x	x	
Art and race						x	x		
Black (style)									
Black Americans	x		x						
Blackface entertainers	x			x		x	x	x	
Caricature						x			
Colored people (United States)	x								
Ethnic attitudes in art	x								
Ethnic identity			x						
Ethnic stereotypes			x		x				
Ethnicity			x					x	
Harlem Renaissance							x	x	x
Identity									
Identity (Psychology) in art									
Minstrels				x		x	x	x	
Negro	x				x		x	x	
Negro minstrel shows			x			x			
Negro Renaissance								x	
Negroes			x						
Parody									
Race (concept)								x	

<b>Racial stereotypes</b>	x		x	x	x		x	x	
<b>Satire</b>									
<b>Stereotype (Psychology) in art</b>					x	x	x	x	

**Appendix H: Card Sort Groupings & Participant-Assigned Categories**

\*Cells highlighted in gray denote a possible accidental placement of a term/concept.

**Pilot: Grouping**

Categories	Items								
Places	Canada	Buffalo	Memphis	Chattanooga	Alabama	Indiana	Cuba		
Instruments	Guitar	Clarinet	Piano	Viola	Mandolin	Voice	Violin	Organ	
Ensembles	Brass	Quartet	Choir	Orchestra					
Sacred	Christmas	Hymns	Psalm tunes	Wedding					
Ethnic	Italian	Turkish	Tejano	Mexican folk	Yiddish				
Dance	Tango	Jig	Habanera	Waltz					
Musical forms	Opera	Etude	Sonata	Canon	Aria	Barcarolle	Serenade	Rondo	March
American Popular Music Genres	Patriotic	Country	Dixieland	Polka	Ragtime	Swing	Jazz		
Subjects	Love	War	Peace	Bridges	Bicycles	Railroads	Trains		

**P1: Grouping**

Categories	SubCat	Items										
Western Classical Music			Choir	Organ	Guitar	Quartet	Orchestra	Piano	Brass	Clarinet	Viola	Violin
Western Classical Music	Ensemble	Voice	Choir	Organ	Guitar	Quartet	Orchestra	Piano	Clarinet	Viola	Violin	
Western Classical Music	Solo	Voice	Organ	Guitar	Piano	Brass	Clarinet	Viola	Violin			
Western Classical Music	Opera	Voice										
Western Classical Music	Vocal	Voice										
Western Classical Music	Forms	Sonata	Canon	Etude								
Western Classical Music	Etude											
Western Classical Music		Tango	Habanera									
Opera	Aria	Voice										
Vocal (Voice)		Voice	Hymns	Psalm Tunes								
Overtures		Orchestra	Opera									
Winds (Woodwinds)		Clarinet										
Strings		Viola	Violin									
Quartet (part)		Viola	Violin									
Choir			Hymns	Psalm Tunes								
Organ			Hymns	Psalm Tunes								
Religious			Hymns	Psalm Tunes								
Genre		Jazz	Country									
Genre	Jazz	Ragtime	Dixieland									
Studies (Etudes)		(list all etudes under here)										
Movements w/in Classical Pieces		Tango	Habanera	Waltz	Rondo	Serenade	Barcarolle	March				

Dance		Tango	Habanera	Waltz	Rondo	Serenade	Barcarolle	March	Swing	Jig	Polka	
Latin	Jazz	Tango										
Cuba		Habanera										
Music and Culture (Nationality)		Italian	Turkish	Mexican folk	Tejano	Yiddish						
Klezmer		Yiddish										
Clarinet		Yiddish										
Viola		Yiddish										
Musical Collections		Wedding	Christmas	Patriotic								
Geographical Location		Indiana	Canada	Cuba	Alabama	Buffalo	Chattanooga	Memphis				
Geographical Location	Music History	Indiana	Canada	Cuba	Alabama	Buffalo	Chattanooga	Memphis				
Conceptual Themes	Emotion	Love	Peace	War								
Conceptual Themes	Transportation	Trains	Railroads	Bicycles								
[Unknown]		Bridges										
[Unknown]		Mandolin										

P2: Grouping

Categories	SubCat	SubCat	SubCat	Items						
Ideas or Events (Subjects)				Peace	War	Love	Patriotic			
Ideas or Events (Subjects)	Events			Wedding	Christmas					
Geographical locations	Americas	North America		Cuba	Canada					
Geographical locations	Americas	North America	States	Indiana	Alabama					
Geographical locations	Americas	North America	Cities	Chattanooga	Memphis					
Tangible things	Transportation (subjects)			Trains	Railroads	Bicycles	Bridges	Buffalo		
Instruments	Ensemble			Orchestra						
Instruments	Wind instruments			Clarinet	Brass					
Instruments	Keyboard instruments			Piano	Organ					
Instruments	String Instruments									
Instruments	String Instruments	Bowed		Violin	Viola					
Instruments	String Instruments	Plucked		Guitar	Mandolin					
Instruments	Vocal			Voice						
Instruments	Vocal	Ensemble		Choir						
Instruments	Vocal	Solo								
Ethnic groups or Ethnicities				Turkish	Italian	Yiddish				
American music				Country	Dixieland	Swing	Ragtime	Jazz		
American music	Ethnic			Hymns						
Ethnic music				Tejano	Mexican folk	Barcarolle				
Ethnic music	Popular ethnic	Dance forms		Polka	Habanera	Tango	March	Jig	Waltz	
Classical music forms of composition				Habanera	Tango	March	Jig	Waltz		
Classical music forms of composition	Vocal			Aria	Opera	Psalm tunes	Hymns			
Classical music forms of composition	Instrumental			Serenade	Rondo	Canon	Etude	Sonata	Quartet	

P3: Grouping

Categories	SubCat	SubCat	Items										
Countries			Canada	Cuba									
States			Alabama	Indiana									
Language			Turkish	Yiddish	Italian								
Cities			Chattanooga	Buffalo	Memphis								
Topics or Subjects			War	Wedding	Love	Christmas	Patriotic	Peace					
Instrument(s)			Voice	Guitar	Mandolin	Brass	Piano	Organ	Choir	Violin	Viola	Orchestra	Clarinet
Transportation			Bridges	Railroads	Bicycles	Trains							
Popular music	Dance forms (European)		Waltz	Jig	Polka								
Popular music	American popular	Country	Dixieland	Country									
Popular music	American popular	Jazz	Ragtime	Jazz	Swing								
Popular music	Latin American popular music		Tango	Habanera	Tejano	Mexican folk							
Classical music	Forms		Quartet	Sonata	Serenade	Canon	Rondo	Etude	March	Barcarolle			
Classical music	Church music		Psalm tunes	Hymns									
Classical music	Opera or vocal		Aria	Opera									

P4: Grouping

Categories	SubCat	Items											
Mexican American (Chicano)		Mexican folk											
Mexican American (Chicano)		Tejano	Polka	Voice	Love								
World Music (by countries)	Cuba	Habanera											
Patriotic & country (place)		Patriotic	Canada	Opera	Waltz	March	Country	Choir	Orchestra	War	Peace		
Early 20th century pop	Dance music	Ragtime	Jazz	Swing	Dixieland	Mandolin	Brass	Clarinet	Piano	Quartet			

P5: Grouping

Categories	Items												
Popular American music	Country	Dixieland	Swing	Ragtime	Jazz								
Performing ensembles	Orchestra	Choir	Quartet										
Ethnic music	Italian	Turkish	Tejano	Yiddish	Mexican folk								
Styles (composition)	Barcarolle	Canon	Rondo	Sonata	March	Serenade	Etude						
Cities/Countries	Buffalo	Memphis	Alabama	Canada	Indiana	Cuba	Chattanooga						
Instruments	Organ	Mandolin	Clarinet	Brass	Viola	Violin	Piano	Guitar					
Human Events/Emotions	Love	War	Peace										
Holidays - Special Events	Wedding	Patriotic	Christmas										
Vocal	Voice	Hymns	Opera	Aria	Psalm tunes								
Transportation	Bicycles	Railroads	Trains	Bridges									
Dance Styles (Form)	Habanera	Polka	Waltz	Tango	Jig								

P6: Grouping

Categories	SubCat	Items											
Holidays		Christmas											

Ceremony(ies)		Wedding									
Modes of transportation		Trains	Railroads	Bridges	Bicycles						
Musical forms		Barcarolle	Hymns	Aria	Serenade	Rondo	Psalm tunes	Opera	Canon	Etude	Sonata
Musical forms	Dance forms	Polka	Waltz	Jig	March	Swing	Tango	Habanera			
Musical instruments		Orchestra	Clarinet	Brass	Piano	Organ	Violin	Choir	Mandolin	Viola	Guitar
Places		Indiana	Canada	Alabama	Memphis	Chattanooga	Buffalo	Cuba			
Musical styles		Dixieland	Jazz	Country	Ragtime	Mexican folk	Tejano	Patriotic			
Major philosophical constructs (I.e. trouble)		Peace	War	Love							
Adjectives		Yiddish	Turkish	Italian							

P7: Grouping

Categories	Sub Cat	Items															
Holidays & Special Events		Christmas	Wedding	Patriotic													
Language		Italian	Turkish	Yiddish													
Performance Medium		Voice															
Performance Medium	Instruments	Viola	Organ	Guitar	Clarinet	Brass	Violin	Piano	Mandolin								
Subjects & Themes		Love	Peace	War	Trains	Railroads	Bridges	Bicycles									
Genre		Country	Mexican folk	Ragtime	Tejano	Jazz	Dixieland	Swing									
Form (Type?)		Opera	Canon	Sonata	Aria	Etude	Polka	Habanera	Rondo	Waltz	Tango	Serenade	Psalm tunes	March	Hymns	Barcarolle	Jig
Type of Performer (or Performance groups)		Choir	Orchestra	Quartet													
Places		Cuba	Canada	Indiana	Alabama	Chattanooga	Memphis	Buffalo									

P8: Grouping

Categories	Items							
Transportation	Railroads	Bicycles	Barcarolle	Bridges	Trains			
Ethnic Music	Mexican folk	Turkish	Canada	Italian	Yiddish	Cuba		
Instruments & Instrument Families	Mandolin	Guitar	Piano	Organ	Viola	Clarinet	Brass	Violin
Orchestra Music	Orchestra							
Music American Style	Jazz	Country	Ragtime	Dixieland	Swing			
Love Songs & Serenades	Serenade	Love						
Dances	Polka	Habanera	Jig	Waltz	Tango	Tejano		
Special occasion	Wedding							
Opera	Opera	Aria						
Vocal Music: Solo, Group, Choir	Voice	Quartet	Choir					
Church Music	Hymns	Psalm tunes						
Holiday Music	Christmas							

Marches (Instrumental & Vocal)	March							
Patriotic Music	Patriotic	Peace	War					
Songs about Locations (States & Cities)	Indiana	Alabama	Chattanooga	Memphis	Buffalo			
Musical Form	Canon	Etude	Sonata	Rondo				

Participant Assigned Categories (A-Z)

P#	Cat 1	Cat 1.1	Cat 1.1.1	Cat 1.1.1.1
P1	[Unknown]			
P1	[Unknown]			
p6	Adjectives			
P2	American music			
P2	American music	Ethnic		
Pilot	American Popular Music Genres			
p6	Ceremony(ies)			
P1	Choir			
p8	Church Music			
P3	Cities			
p5	Cities/Countries			
P1	Clarinet			
P3	Classical music	Forms		
P3	Classical music	Church music		
P3	Classical music	Opera or vocal		
P2	Classical music forms of composition			
P2	Classical music forms of composition	Vocal		
P2	Classical music forms of composition	Instrumental		
P1	Conceptual Themes	Emotion		
P1	Conceptual Themes	Transportation		
P3	Countries			
P1	Cuba			
Pilot	Dance			
P1	Dance			
p5	Dance Styles (Form)			
p8	Dances			
p4	Early 20th century pop	Dance music		
Pilot	Ensembles			
Pilot	Ethnic			
P2	Ethnic groups or Ethnicities			
P2	Ethnic music			
P2	Ethnic music	Popular ethnic	Dance forms	
p5	Ethnic music			
p8	Ethnic Music			
p7	Form (Type?)			
P1	Genre			
P1	Genre	Jazz		
p7	Genre			
P1	Geographical Location			
P1	Geographical Location	Music History		
P2	Geographical locations	Americas	North America	
P2	Geographical locations	Americas	North America	States
P2	Geographical locations	Americas	North America	Cities
p8	Holiday Music			
p6	Holidays			
p5	Holidays - Special Events			
p7	Holidays & Special Events			
p5	Human Events/Emotions			
P2	Ideas or Events (Subjects)			
P2	Ideas or Events (Subjects)	Events		
P3	Instrument(s)			
Pilot	Instruments			
P2	Instruments	Ensemble		
P2	Instruments	Wind instruments		

P2	Instruments	Keyboard instruments		
P2	Instruments	String Instruments		
P2	Instruments	String Instruments	Bowed	
P2	Instruments	String Instruments	Plucked	
P2	Instruments	Vocal		
P2	Instruments	Vocal	Ensemble	
P2	Instruments	Vocal	Solo	
p5	Instruments			
p8	Instruments & Instrument Families			
P1	Klezmer			
P3	Language			
p7	Language			
P1	Latin	Jazz		
p8	Love Songs & Serenades			
p6	Major philosophical constructs (i.e. trouble)			
p8	Marches (Instrumental & Vocal)			
p4	Mexican American (Chicano)			
p4	Mexican American (Chicano)			
p6	Modes of transportation			
P1	Movements w/in Classical Pieces			
p8	Music American Style			
P1	Music and Culture (Nationality)			
P1	Musical Collections			
p8	Musical Form			
Pilot	Musical forms			
p6	Musical forms			
p6	Musical forms	Dance forms		
p6	Musical instruments			
p6	Musical styles			
P1	Opera	Aria		
p8	Opera			
p8	Orchestra Music			
P1	Organ			
P1	Overtures			
p4	Patriotic & country (place)			
p8	Patriotic Music			
p7	Performance Medium			
p7	Performance Medium	Instruments		
p5	Performing ensembles			
Pilot	Places			
p6	Places			
p7	Places			
p5	Popular American music			
P3	Popular music	Dance forms (European)		
P3	Popular music	American popular	Country	
P3	Popular music	American popular	Jazz	
P3	Popular music	Latin American popular music		
P1	Quartet (part)			
P1	Religious			
Pilot	Sacred			
p8	Songs about Locations (States & Cities)			
p8	Special occasion			
P3	States			
P1	Strings			
P1	Studies (Etudes)			
p5	Styles (composition)			
Pilot	Subjects			
p7	Subjects & Themes			
P2	Tangible things	Transportation (subjects)		
P3	Topics or Subjects			
P3	Transportation			
p5	Transportation			

p8	Transportation			
p7	Type of Performer (or Performance groups)			
P1	Viola			
p5	Vocal			
P1	Vocal (Voice)			
p8	Vocal Music: Solo, Group, Choir			
P1	Western Classical Music			
P1	Western Classical Music	Ensemble		
P1	Western Classical Music	Solo		
P1	Western Classical Music	Opera		
P1	Western Classical Music	Vocal		
P1	Western Classical Music	Forms		
P1	Western Classical Music	Etude		
P1	Winds (Woodwinds)			
p4	World Music (by countries)	Cuba		

**Appendix I: Normalized Card Sort Categories**

\*Cells highlighted in yellow denote overlap between categories or unexpected placement of terms/concepts within an established category.

Normalized Category	P#	Original Categories
Instrument(ation) / Performance Medium	p1	Clarinet
	p1	Organ
	p1	Quartet
	p1	Strings
	p1	Viola
	p1	Vocal (Voice)
	p1	Choir
	p1	Western Classical Music -- Vocal
	p1	Western Classical Music -- Ensemble
	p1	Western Classical Music -- Solo
	p1	Winds
	p2	Instruments
	p2	Instruments--Ensemble
	p2	Instruments--Wind
	p2	Instruments--Keyboard
	p2	Instruments--String
	p2	Instruments--String--Bowed
	p2	Instruments--String--Plucked
	p2	Instruments--Vocal
	p2	Instruments--Vocal--Ensemble
	p2	Instruments--Vocal--Solo
	p2	Classical music forms of composition -- vocal
	p2	Classical music forms of composition -- instrumental
	p3	Instrument(s)
	p3	Classical music -- vocal
	p5	Instruments
	p5	Performance ensembles
	p5	Vocal
	p6	Musical instruments
	p7	Performance medium (Voice goes under here)
	p7	Performance medium -- Instruments
	p7	Performance groups (orchestra, choir, quartet)
	p8	Orchestra music
	p8	Vocal music: Solo, Group, Choir
	pilot	Ensembles
	pilot	Instruments

Normalized Category	P#	Original Categories
Places/Location	p1	Geographic Location
	p1	Geographic Location -- Music History
	p1	Cuba
	p2	Geographic Locations -- Americas -- North America -- States
	p2	Geographic Locations -- Americas -- North America -- Cities
	p3	States

	p3	Cities
	p3	Countries
	p5	Cities/Countries
	p6	Places
	p7	Places
	p8	Songs about Locations (States & Cities)
	pilot	Places

Normalized Category	P #	Original Categories	Terms																
"Form"	p 1	Studies (Etudes)	(list all etudes under here)																
	p 1	Overtures	Orchestra	Opera															
	p 1	Western Classical Music -- Forms	Canon	Etude	Sonata														
	p 1	Dance	Barcarolle	Habaneira	Jig	March	Polka	Rondo	Serenade	Swing	Tango	Waltz							
	p 2	Classical forms of composition	Habaneira	Jig	March	Tango	Waltz												
	p 3	Classical music -- Forms	Barcarolle	Canon	Etude	March	Quartet	Rondo	Serenade	Sonata									
	p 5	Dance styles (Form)	Habaneira	Jig	Polka	Tango	Waltz												
	p 5	Styles (composition)	Barcarolle	Canon	Etude	March	Rondo	Serenade	Sonata										
	p 6	Musical forms	Aria	Barcarolle	Canon	Etude	Hymns	Opera	Psalm tunes	Rondo	Serenade	Sonata							
	p 6	Musical forms -- Dance forms	Habaneira	Jig	March	Polka	Swing	Tango	Waltz										
	p 7	Form (Type?)	Aria	Barcarolle	Canon	Etude	Habaneira	Hymns	Jig	March	Opera	Polka	Psalm tunes	Rondo	Serenade	Sonata	Tango	Waltz	
	p 8	Musical forms	Canon	Etude	Rondo	Sonata													
	p 8	Marches (Instrumental & vocal) {facet}	March																

pilot	p8	Dances	Habaneera	Jig	Polka	Tango	Tejano	Waltz										
	pi	Musical forms	Aria	Barcarolle	Canon	Etude	March	Opera	Rondo	Serenade	Sonata							
	lot	Dance	Habaneera	Jig	Tango	Waltz												

Normalized Category	P#	Original Categories	Terms															
"Genres"	p1	Western Classical Music -- Opera	Voice															
	p1	Opera -- Aria	Voice															
	p1	Genre	Jazz	Country														
	p1	Genre -- Jazz	Dixieland	Ragtime														
	p1	Genre -- Latin -- Jazz	Tango															
	p2	American Music	Country	Dixieland	Jazz	Ragtime	Swing											
	p2	American Music -- Ethnic	Hymns															
	p3	Popular music -- Dance forms (European)	Jig	Polka	Waltz													
	p3	Popular music -- American popular--Country	Country	Dixieland														
	p3	Popular music -- American popular--Jazz	Jazz	Ragtime	Swing													
	p3	Popular music -- Latin American popular music	Habaneera	Mexican folk	Tango	Tejano												
	p4	Early 20th century popular music -- Dance music	Brass	Clarinet	Dixieland	Jazz	Mandolin	Piano	Quartet	Ragtime	Swing							
	p5	Popular American music	Country	Dixieland	Jazz	Ragtime	Swing											
	p6	Musical styles	Country	Dixieland	Jazz	Mexican folk	Patriotic	Ragtime	Tejano									
	p7	Genre	Country	Dixieland	Jazz	Mexican folk	Ragtime	Swing	Tejano									
p8	Opera	Opera	Aria															
p8	Music American Style	Country	Dixieland	Jazz	Ragtime	Swing												
pi	American Popular Music Genres	Country	Dixieland	Jazz	Patriotic	Polka	Ragtime	Swing										

Normalized Category	P#	Original Categories	Terms																
Ethnic (maybe under genre)	p1	Music and Culture (Nationality)	Italian	Mexican folk	Tejano	Turkish	Yiddish												
	p2	Ethnic music	Barcarolle	Mexican folk	Tejano														
	p2	Ethnic -- Popular ethnic -- Dance forms	Habaneera	Jig	March	Polka	Tango	Waltz											
	p2	Ethnic groups or Ethnicities	Italian	Turkish	Yiddish														
	p3	Language	Italian	Turkish	Yiddish														
	p4	Mexican American (Chicano)	Love	Polka	Tejano	Voice													
p4	Mexican American (Chicano)		Mexican																

			folk						
p4	World Music (by countries) -- Cuba	Habanera							
p5	Ethnic music	Italian	Mexican folk	Tejano	Turkish	Yiddish			
p7	Language	Italian	Turkish	Yiddish					
p8	Ethnic music	Canada	Cuba	Italian	Mexican folk	Turkish	Yiddish		
pilot	Ethnic	Italian	Mexican folk	Tejano	Turkish	Yiddish			
p6	Adjectives	Italian	Turkish	Yiddish					

Normalized Category												
	P#	Original Categories	Terms									
Subject - - "General"	pilot	Subjects	Bicycles	Bridges	Love	Peace	Railroads	Trains	War			
	p7	Subjects & Themes	Bicycles	Bridges	Love	Peace	Railroads	Trains	War			
	p3	Topics or Subjects	Christmas	Love	Patriotic	Peace	War	Wedding				
Subject - - "Situational"	p6	Ceremony(ies)	Wedding									
	p8	Holiday music	Christmas									
	p6	Holidays	Christmas									
	p5	Holidays - Special Events	Christmas	Patriotic	Wedding							
	p7	Holidays & Special Events	Christmas	Patriotic	Wedding							
	p2	Ideas or Events (Subjects) -- Events	Christmas	Wedding								
	p8	Special occasion	Wedding									
	p4	Patriotic & country (place)	Canada	Choir	Country	March	Opera	Orchestra	Patriotic	Peace	Wal tz	War
	p8	Church music	Hymns	Psalm tunes								
	p3	Classical music -- Church music	Hymns	Psalm tunes								
	p1	Religious	Hymns	Psalm Tunes								
pilot	Sacred	Christmas	Hymns	Psalm tunes	Wedding							
Subject - - "Conceptual"	p5	Human events/emotions	Love	Peace	War							
	p2	Ideas or Events (Subjects)	Love	Patriotic	Peace	War						
	p8	Love songs & serenades	Love	Serenade								
	p6	Major philosophical constructs	Love	Peace	War							
	p8	Patriotic music	Patriotic	Peace	War							
	p1	Conceptual themes -- Emotion	Love	Peace	War							
Subject - -	p6	Modes of transportation	Bicycles	Bridges	Railroads	Trains						

"Tangible "	p2	Tangible things - - Transportation (subjects)	Bicycles	Bridges	Buffalo	Railroads	Trains						
	p1	Conceptual themes -- Transportation	Bicycles	Railroads	Trains								
	p3	Transportation	Bicycles	Bridges	Railroads	Trains							
	p5	Transportation	Bicycles	Bridges	Railroads	Trains							
	p8	Transportation	Bicycles	Bridges	Railroads	Trains							