

# Domain Analytic, and Domain Analytic-Like, Studies of Catalog Needs: Addressing the Ethical Dilemma of Catalog Codes Developed with Inadequate Knowledge of User Needs

Maurine W. McCourry

Hillsdale College, 33 E. College St., Hillsdale, MI 49242, U.S.A., <mmccourry@hillsdale.edu>

Maurine McCourry is Technical Services Librarian at Hillsdale College, where she is responsible for the acquisition and cataloging of monographic material, and for the maintenance of the integrated library system. She is also Adjunct Instructor, Graduate School of Library and Information Science, at Dominican University, teaching a beginning course in the organization of knowledge. She holds a PhD in library and information science from Dominican University, and does research in the ethics of library cataloging. Her dissertation, "RDA and the Music Student: A Domain Analytic Approach to Catalog Needs," proposed the model described in this paper.



McCourry, Maurine. **Domain Analytic, and Domain Analytic-Like, Studies of Catalog Needs: Addressing the Ethical Dilemma of Catalog Codes Developed with Inadequate Knowledge of User Needs.** *Knowledge Organization*. 42(5), 339-345. 34 references.

**Abstract:** Although cataloging in libraries has been done for decades with the oft-stated intention of serving user needs, there is little evidence that those needs have been empirically assessed. This paper proposes a domain analytic model for systematically making such assessments, and for altering existing cataloging practice to meet the assessed needs. The author's dissertation research into the catalog needs of a single, narrowly-defined domain is used as an example of the type of study that may be repeated with an infinite number of domains, thereby providing a type of data regarding catalog needs not previously available.

Received: 16 July 2015; Accepted 16 July 2015

Keywords: domain analytic, cataloging codes, user needs

## 1.0 Introduction

This paper summarizes my dissertation research and explores ways in which research can be strengthened in its affiliation with the domain-analytic paradigm and ways in which it might be disseminated to produce actionable data that, in turn, can improve the provision of descriptive cataloging meeting the needs of diverse populations of users. The understanding that the library community has an ethical responsibility to provide catalogs that meet user needs is implied in the Code of Ethics of the American Library Association, which states that librarians "provide the highest level of service to all library users through appropriate

and usefully organized resources" (American Library Association 2008). This understanding has been reiterated in the literature, perhaps most directly by Bair (2005), but also by Bade (2002; 2009) and Beghtol (2008).

Beghtol (2008) called for dialog on these issues. My assumption is that the first Conference on the Ethics of Information Organization in 2009 was held, at least in part, in response to that suggestion. Among the papers presented, two specifically addressed the ethical problem of codes for descriptive cataloging being developed with inadequate reference to empirically assessed user needs. Smiraglia (2009, 685) suggested studies "to quantify the limitations of the catalog vis-`a-vis its inability to accommodate

cultural warrant, and in turn, domain-specificity and activity theory,” referencing Hjørland (1997). Hoffman (2009) also cited Hjørland, suggesting that the concept of domain analysis detailed in Hjørland and Albrechtsen (1995) and Hjørland (2002) might be a useful framework for empirical studies of domains of users that could improve the service of user needs by catalogers following standard codes of cataloging.

The most recent cataloging code to be widely adopted throughout the cataloging community is *Resource Description and Access (RDA)*, adopted by the Library of Congress (LC) in March of 2013 and by most major library systems around the same time as a result of LC’s influence. Hoffman (2009) suggested that the development of the theoretical model on which *RDA* is based, *Functional Requirements for Bibliographic Records (FRBR)*, was not rooted properly in studies of user needs. Since there is evidence (Pisanski and Žumer, 2010a; 2010b; 2012) that *FRBR* does match established “mental models of the bibliographic universe” (Pisanski and Žumer, 2010a, 644), it may be possible to adjust *RDA* even at this late stage to more closely match user needs. But first, those needs need to be more thoroughly assessed, and from a much more diverse collection of points of view.

The purpose of this paper is to address the following questions: 1) Can studies of small domains of users help to solve the ethical dilemma of cataloging codes created with limited empirical knowledge of user needs?; 2) to what extent should such studies be methodologically aligned with previous domain analytic investigations in knowledge organization (KO)?; and 3) what evidence exists to suggest that *RDA* should serve users of all types, and what is the role of ethics in any such suggestion?

## 2.0 Ethics and Catalog User Studies

The paradigm shift in library and information science (LIS) documented by Dervin and Nilan (1986) from focus on the system, in the broad sense, to focus on the user, had been suggested throughout the profession’s modern history, even if it was not realized until later. Even Cutter (1904, 6), in his preface to the posthumously published fourth edition of his Rules, mentioned the importance of service to user needs stating that, “The convenience of the public is always to be set before the ease of the cataloger.”

The need for user studies related to library catalogs was recognized early, too, reflecting this long-standing awareness of the need to serve users. Randall (1930) issued a call for such studies, and Akers (1931, 394), a survey “undertaken as the first step in ascertaining to what extent the existing card catalogues in liberal-arts colleges meet the needs of students,” was the first published answer. Many other studies followed, as documented by Markey (1980), and

these catalog studies were joined by numerous studies of information retrieval (IR) systems. Some of the techniques used to study IR systems were used in the larger studies that followed the introduction of the online public access catalog (OPAC), beginning with Brownrigg et al. (1982).

The vast majority of catalog user studies through the years have focused on assessing use in the context of existing catalogs. The expansive quantitative studies that dominated the field in the last century are principally studies of current catalog use, and even many of the more recent qualitative studies (Novotny 2004; Hider and Tan, 2008; Zhang and Novotny, 2008) tend to focus on how users interact with the system, writ large. To truly assess user needs, however, in the context of the user rather than the system, we need to find a way to ask about needs without reference, as much as possible, to any existing system. Even Akers (1931) suggested this approach, but it has not been done to any great extent to date.

Relating this need for objective, empirical, user-focused user studies to the ethics of librarianship and library and information science (LIS), broadly, and to ethics in KO, or cataloging, specifically, is complicated by the fact that library cataloging, as a domain, is still at work on the establishing of a succinct and generally accepted statement of ethics. Bair (2005) made a great deal of progress toward that goal, and more is being done at this conference, but we are still not completely clear in our articulation of our ethical stance. We have been clear for several decades now, though, that our focus as scholars and professionals must be on the user, not the system, and this fact, in itself, is enough to warrant user studies that are so oriented.

## 3.0 A Proposed Model

Domain analysis in LIS, as outlined by Hjørland and Albrechtsen (1995), requires considering not individual users, but domains of users. Whereas a robust cognitive study of users would include data from multiple individuals, a robust socio-cognitive, or domain-analytic, study of users should, perhaps, include data from multiple domains. The model detailed in McCourry (2014), therefore, is of only one part of a proposed study. A complete study would replicate the study in the model numerous times with numerous different domains. In fact, to obtain a complete, “cumulative” (Tennis 2003, 192) picture of user needs would be a theoretically infinite task, but ongoing work to continually update and improve the picture would be a practical approach to better service to user needs.

McCourry (2014) defined the studied domain narrowly as a preliminary step of operationalization, as suggested by Tennis (2003), specifying it to include liberal arts students at a small (FTE 1750 or below) college enrolled in applied music classes for credit toward their degrees. The

first of three methodologies employed, a questionnaire, was tested on the defined domain at one college, and the model was developed using students from a different college over two semesters in a single academic year.

The questions used for all three methodologies employed, including the questionnaire, one-on-one interviews, and a focus group, were framed with the goal of leading the students as little as possible to a particular answer, while still prompting them to describe the elements of bibliographic information by which they needed to search a library catalog. While it proved impossible to come up with questions that did not suggest some elements of bibliographic information, the variety of answers received suggests that some success toward the end of open questioning was achieved. The questionnaire is shown below in Table 1.

The questions for the interviews and focus group followed the same pattern as the questions for the questionnaire, but encouraged even greater speculation regarding an “ideal” library catalog. The questions used as a guide to the interviews and focus group are given in Tables 2 and 3. All were conducted in a semi-structured manner,

with some variation in order and wording, but emphasis on ideal situations rather than existing ones, and avoidance of extensive reference to existing systems, was maintained.

The questionnaire was sent to the full, identified domain, which consisted of 136 students, and 38 completed questionnaires were returned. Volunteers for the interviews and focus group were recruited from the same domain the following semester, with seven signing up for interviews, and five for the focus group. Seven one-on-one, half-hour interviews and a one-hour, five-person focus group session were conducted, and the recordings were transcribed.

The elements of bibliographic information needed by this group of students in a library catalog was inferred by using basic content analysis as described in Weber (1990) to gather terms identifying those elements in the language of the participants. Equivalent terms were gathered into narrowly defined categories, such as “Title—movement,” resulting in a list of 96 elements of information identified as needed in a library catalog to support these students in their study of music.

### Survey Questions

When you come to the library or to the library website looking for sound recordings (CDs, for example) to support your college-level music studies, what information do you bring about the materials you need? In other words, what information might you already have about those needed recordings? List any words you can think of to describe that information.

When you come to the library or to the library website looking for printed music (scores or sheet music, for example) to support your college-level music studies, what information do you bring about the materials you need? In other words, what information might you already have about those needed materials? List any words you can think of to describe that information.

When you come to the library or to the library website looking for books to support your college-level music studies, what information do you bring about the materials you need? In other words, what information might you already have about those books? List any words you can think of to describe that information.

When you come to the library or to the library website looking for magazine, newspaper, or journal articles to support your college-level music studies, what information do you bring about the materials you need? In other words, what information might you already have about those materials? List any words you can think of to describe that information.

When you come to the library or to the library website looking for video recordings (DVDs, for example) to support your college-level music studies, what information do you bring about the materials you need? In other words, what information might you already have about those videos? List any words you can think of to describe that information.

When you find information about music materials through library websites such as the library catalog, what information do you need to see in order to know if the material described is what you need? List any words you can think of to describe that information.

What information available through a commercial resource such as Amazon or Google would you find helpful in a library catalog or another online resource describing library materials having to do with music?

What, if anything, frustrates you about finding music materials in online library resources such as websites, catalogs, and databases?

What, if anything, frustrates you about finding music materials through commercial online resources such as Amazon or Google?

In what year do you anticipate graduating?

Are you majoring or minoring in music?

Table 1

### Interview Questions

I asked you to participate in this study based on the fact that you have taken applied music lessons for credit, but I am interested in how you find materials to support all of your college-level studies in music. Did you bring an example of the type of materials you've needed to find to support your music studies?

How would you describe this material? (In other words, if you were sending a friend to the library to pick this up for you, how would you describe it to that person?)

How would you like to be able to find this sort of material in a library, or even in a retail location, physical or virtual? I don't really want to know how you would search for it, necessarily, but more how you would LIKE to be able to search for it.

What other music-related information needs do you have or have you had to support your study of music at [College DJ]? For instance have you needed books from the library, or recordings from Naxos, or any other type of information, either suggested or required by your instructor or not?

How did you find the information you needed? For instance, did you use a library catalog or another library resource, or did you already have information such as a call number, or did you find the information somewhere else?

How would you describe an ideal way to find sheet music or scores to support your music studies? Not necessarily any ways that currently exist—just the best method you can imagine.

How about the ideal way to find books to support your music studies?

How about the ideal way to find audio recordings to support your music studies?

How about the ideal way to find video recordings to support your music studies?

Table 2

### Focus Group Question

I asked you all to participate in this study based on the fact that you have taken applied music lessons for credit, but I am interested in how you find materials to support all of your college-level studies in music. How many of you have used the library to find materials to support any of your studies in music?

That were those things, and how did you go about finding them?

In an ideal world, how would like to be able to search for them?

Do you search for materials to support your music studies outside of the library?

How do you go about finding those things?

How would you like to go about finding them?

Table 3

The list of elements was then mapped to specific *RDA* instructions, with the exception of 14 of the 96 elements, which would not be supplied by any existing instruction in *RDA*. Elements identified as “core” in *RDA* matched 28 of the 96, and 22 of the 96 were identified as both “core” in *RDA* and as recommended in *Best Practices for Music Cataloging Using RDA and MARC21*, published by the Music Library Association (MLA) (*RDA* Music Implementation Task Force 2014, 83). Figure 1 illustrates these results.

Since cataloging in most libraries offering music materials may only reasonably be expected to include these “core” and “recommended” elements, only 52% of the elements of information identified by these students as needed in a library catalog are elements likely to be included in these catalogs. It is possible that if similar numbers were to be discovered in studies of members of other domains, an assumption could be made that *RDA* meets only some empirically assessed needs.

### 4.0 Refining the Model in Terms of Previous Domain Analytic Investigations

There is some ambiguity in the literature concerning exactly what sort of research constitutes domain analysis. An article cited on ResearchGate as scheduled for publication in October of this year by Hanne Albrechtsen, with the working title “This is not Domain Analysis,” in fact, may address the use I have made of the term, which reflects, in Albrechtsen’s words “the tendency to use the term Domain Analysis to indicate a theoretical foundation for the study of user needs” (Albrechtsen 2015). I look forward to her thoughts on this. But at present, I argue that the use of domain analysis as a theoretical framework is supported by Hjørland and Albrechtsen (1995), the article, which Smiraglia (2012, 114) identifies as the “challenge to redirect the information science community toward domain analysis.”

Hjørland and Albrechtsen (1995, 413) imply that domain analysis is a meta-theory, to be applied generally as a viewpoint of the entire discipline, saying that “domain-analysis—building on more socio-cultural, pragmatic, and realistic theories of cognition—represents an alternative theory to the cognitive phenomena, and in this respect, domain-analysis and cognitivism are not two supplementary points of view, but two mutually exclusive theoretical viewpoints.” If this approach is accepted, it must be applicable to all studies in LIS, not just studies involving particular academic disciplines, or domains as defined in Smiraglia (2014). To approach all of LIS study in terms of academic disciplines is to ignore the majority of the population that the practitioners of LIS serve. Most people are not academics and are not affiliated with any aca-

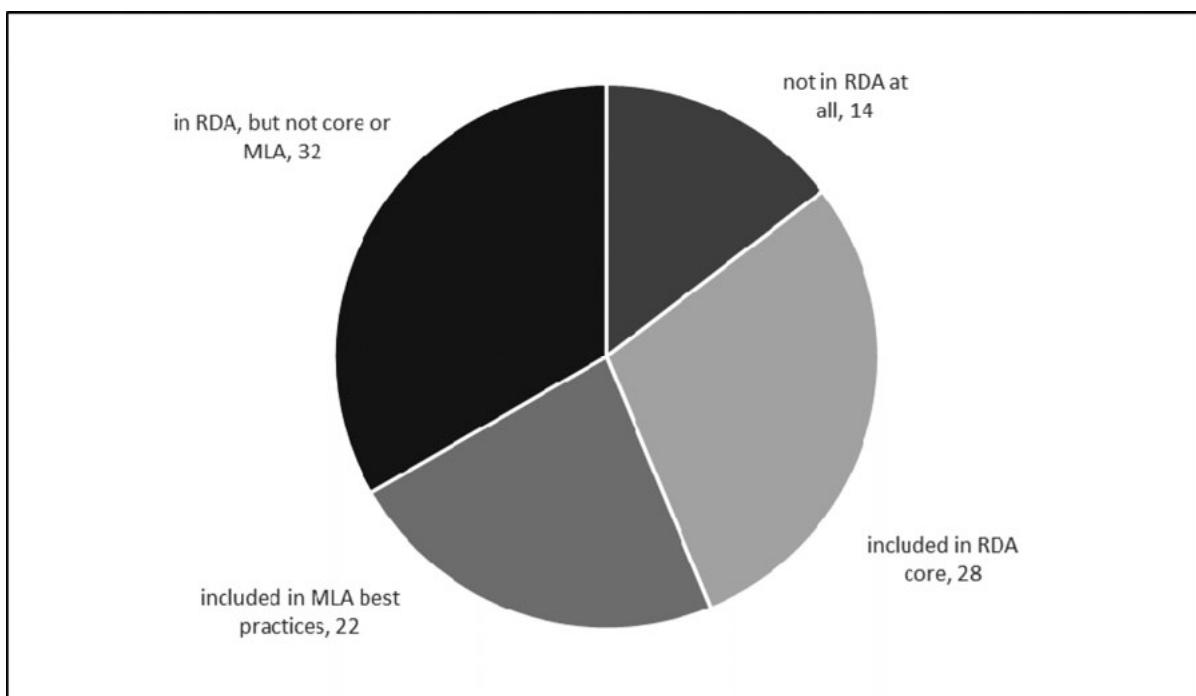


Figure 1.

demic discipline. They are members of many groups, however, whether they identify as parents or as members of a particular gender or as participants in a particular activity. The study of the information needs and use of these groups is as important in the role of LIS in society as the discipline's study of the information needs and uses of formal discourse communities such as academic disciplines.

Hjørland (2004, 21) addresses this in an addendum, stating explicitly that, "any claim that domain analysis is only concerned with academic subjects is not true." The domain-analytic studies as identified in Smiraglia (2012) reflect this stance, as does Jihee Beak's dissertation work (Beak 2014), which looks at the metadata needs of children. Beak's dissertation certainly has parallels to my own, but recommends a new metadata schema to serve the identified needs rather than a revision of an existing schema such as *RDA*.

The methodologies used in my dissertation approach domain analysis, if somewhat tangentially, since the goal was to obtain specific types of information, not information about the domain generally. Similarly, they approach qualitative methods, but do not fully qualify as such, given, again, that information of a specific type was sought, requiring the asking of "what" questions, whereas a truly qualitative methodology might be defined as only asking "how" and "why" questions (Mellon 1990). Whether basic content analysis of terms identified in the study can be described as a form of domain analysis is perhaps best left to others to answer. "Empirical user studies" (Hjørland 2002,

430) are explicitly mentioned as one of "eleven approaches" (Hjørland 2002, 422) to domain analysis, but whether my specific methodologies fit is still not completely clear.

## 5.0 Disseminating the Model

Regardless of what it is called, this model does have potential for application by practitioners working with diverse populations. Once the questions addressed in this paper have been sufficiently answered, I hope to publish steps for this sort of analysis in an article format with easy-to-follow steps for replication in any library setting. The recommendations would include suggested wording for questionnaire, interview, and focus group questioning, suggested methods of analysis of the collected data, and techniques for mapping the data to *RDA*. Suggestions for changes to *RDA* based on the results of such studies might be best coordinated through an existing body within the established cataloging community.

This would be an enormous undertaking, and would have to be pursued as an ongoing project, preferably by more than one researcher. There is clearly still theoretical work here to be done, but there is practical work, too.

## 6.0 Applying the Data to an Ethical Purpose

Hoffman (2009, 9) suggests that a domain analytic study of user needs might facilitate the development in cataloging codes of "particular rules for domains." It might be

more practical though, in a world in which the most-used code is accessed almost exclusively online, to develop a single code that serves all domains. Such a code may end up being rather long, but length may not really be a concern for a code used as a database of information consulted as needed rather than read and absorbed as a whole.

Cataloging in libraries today is dominated by copy cataloging, with existing bibliographic records reproduced, sometimes with some editing, for use in a local catalog. Original cataloging is performed as necessary, but the majority of cataloging is performed by central agencies or organizations and then reused multiple times in multiple places. Cataloging in the future, though, is likely to be dynamically shared rather than duplicated. A single bibliographic record is likely to be made up primarily of numerous links to other records, including links to authority records for works, names, subjects, and locations. The manifestation-level parts of a bibliographic record in such a system would be stored in a single catalog used by multiple, perhaps even most, libraries, preferably in a database such as the existing WorldCat.

A shared catalog has to meet the needs of all potential users. To make the catalog serve the average user will serve no user fully. If we can make that catalog meet the needs of an ever-widening collection of domains of users, we may come closer than ever to fully meeting the catalog needs of all users.

## 7.0 Ethics and *RDA*

One of the “objectives and principles” listed in the introduction to *RDA* is a “responsiveness to user needs,” based in part on the “user tasks” identified in *FRBR* (American Library Association 2010, section 0.4.2). *FRBR*, in turn, is intended to encompass a “broad range of user expectations and needs” (IFLA Study Group on the Functional Requirements for Bibliographic Records 1998, 1). *RDA* is intended to produce data able “to function within a wide range of technological environments” (American Library Association 2010), and must, therefore, serve users of all types. It follows, too, that cataloging according to its instructions should meet the needs of every domain of users that might use that information.

*RDA* is already a long and complicated document. It is, though, a continually updated document, designed to be used online, and to be changed as needs, uses, and understandings change. I do not doubt that the professionals responsible for the care and feeding of *RDA* have every intention of upholding the profession’s highest ethical standards. I do doubt, however, that *RDA* can be fully a part of this ethical service without a more rigorous matching of its instructions with rigorous assessments of diverse user needs.

## 8.0 Conclusion

To answer the questions addressed in this study, I believe that studies of small domains of users may indeed help to solve the demonstrated ethical problem of cataloging codes, such as *RDA*, created with seemingly limited empirical knowledge of user needs. Much additional work needs to be done to conduct such studies and, especially, to apply them to changes in the code itself, but I believe there is promise in the possibility.

In terms of methodological alignment with previous domain analytic investigation in the domain of KO, I believe there are possibilities for a more robust correspondence with the existing literature. That being said, though, I strongly believe that ethical service to all users can be strengthened in this manner, and that user groups of all types, whether or not deemed to be “domains,” should be examined in terms of catalog needs, and that a mostly qualitative methodology, in which questions are asked as far from existing catalogs as possible, is the direction those studies should take.

And finally, since *RDA* has been almost universally accepted now as the standard for current library cataloging, there is no question in my mind that it has to serve all users. It cannot do so, though, if it is built only on tradition and assumption of user needs. Needs have to be assessed, and they have to be assessed not strictly cognitively. The socio-cognitive paradigm has to be adopted for user studies if those studies are to serve diverse needs.

## References

Akers, Susan Grey. 1931. “To What Extent Do the Students of the Liberal-Arts Colleges Use the Bibliographic Items Given on the Catalogue Card?” *The Library Quarterly* 1: 394–408.

Albrechtsen, Hanne. 2015. “This Is Not Domain Analysis” (October 10). [http://www.researchgate.net/publication/274510579\\_This\\_is\\_not\\_Domain\\_Analysis](http://www.researchgate.net/publication/274510579_This_is_not_Domain_Analysis).

American Library Association. 2008. “Code of Ethics of the American Library Association.” <http://www.ala.org/advocacy/proethics/codeofethics/codeethics>.

American Library Association. 2010. *RDA toolkit*. Chicago, Ill: American Library Association.

Bade, David. 2002. *The Creation and Persistence of Misinformation in Shared Library Catalogs: Language and Subject Knowledge in a Technological Era*. Champaign, Ill.: Publications Office, Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign.

Bade, David. 2009. “Ethos, Logos, Pathos or Sender, Message, Receiver?: A Problematical Rhetoric for

Information Technologies.” *Cataloging & Classification Quarterly* 47, no. 7: 612–30.

Bair, Sheila. 2005. “Toward a Code of Ethics for Cataloging.” *Technical Services Quarterly* 23, no. 1: 13–26.

Beak, Jihee. 2014. “A Child-Driven Metadata Schema: A Holistic Analysis of Children’s Cognitive Processes during Book Selection.” PhD dissertation, University of Wisconsin-Milwaukee.

Beghtol, Clare. 2008. “Professional Values and Ethics in Knowledge Organization and Cataloging.” *Journal of Information Ethics* 17: 12–9.

Brownrigg, Edwin Blake, Gary S. Lawrence and Council on Library Resources University of California (System), Division of Library Automation. 1982. *Users Look at Online Catalogs: Results of a National Survey of Users and Non-Users of Online Public Access Catalogs: Final Report to the Council on Library Resources*. Berkeley, Calif.: Division of Library Automation and Library Research and Analysis Group, Office of the Assistant Vice President - Library Plans and Policies, University of California Systemwide Administration.

Cutter, Charles A. 1904. *Rules for a Dictionary Catalog*. 4th, rewritten. Washington, DC: Government Printing Office.

Dervin, Brenda and Michael Nilan. 1986. “Information Needs and Uses.” *Annual Review of Information Science & Technology* 21: 3–33.

Hider, Philip and Kah-ching Tan. 2008. “Constructing Record Quality Measures Based on Catalog Use.” *Cataloging & Classification Quarterly* 46, no. 4: 338–61.

Hjørland, Birger and Hanne Albrechtsen. 1995. “Toward a New Horizon in Information Science: Domain-Analysis.” *Journal of the American Society for Information Science* 46: 400–25.

Hjørland, Birger. 1997. *Information Seeking and Subject Representation: An Activity-Theoretical Approach to Information Science*. Westport, Conn.: Greenwood Press.

Hjørland, Birger. 2002. “Domain Analysis in Information Science: Eleven Approaches - Traditional as Well as Innovative.” *Journal of Documentation* 58: 422–62.

Hjørland, Birger. 2004. “Domain Analysis: A Socio-Cognitive Orientation for Information Science Research.” *Bulletin of the American Society for Information Science and Technology* 30, no. 3: 17–21.

Hoffman, Gretchen L. 2009. “Meeting Users’ Needs in Cataloging: What Is the Right Thing to Do?” *Cataloging & Classification Quarterly* 47, no. 7: 631–41.

IFLA Study Group on the Functional Requirements for Bibliographic. 1998. *Functional Requirements for Bibliographic Records: Final Report*. Munchen: K.G. Saur. <http://archive.ifla.org/VII/s13/frbr/frbr.pdf>.

Markey, Karen. 1980. *Research Report on Analytical Review of Catalog Use Studies*. Columbus, Ohio: OCLC, Inc.

McCourry, Maurine. 2014. “RDA and the Music Student: A Domain Analytic Approach to Catalog Needs.” PhD dissertation, Dominican University.

Mellon, Constance A. 1990. *Naturalistic Inquiry for Library Science: Methods and Applications for Research, Evaluation, and Teaching*. New York: Greenwood Press.

Novotny, Eric. 2004. “I Don’t Think I Click: A Protocol Analysis Study of Use of a Library Online Catalog in the Internet Age.” *College & Research Libraries* 65: 525–37.

Pisanski, Jan and Maja Žumer. 2010a. “Mental Models of the Bibliographic Universe. Part 1: Mental Models of Descriptions.” *Journal of Documentation* 66: 643–67.

Pisanski, Jan and Maja Žumer. 2010b. “Mental Models of the Bibliographic Universe. Part 2: Comparison Task and Conclusions.” *Journal of Documentation* 66: 668–80.

Pisanski, Jan and Maja Žumer. 2012. “User Verification of the FRBR Conceptual Model.” *Journal of Documentation* 68, no. 4: 582–92.

Randall, William N. 1930. “The Use of Library Catalogs: A Research Project.” *ALA Catalogers’ and Classifiers’ Yearbook* 2: 24–32.

RDA Music Implementation Task Force. 2014. *Best Practices for Music Cataloging Using RDA and MARC21*. [http://bcc.musiclibraryassoc.org/BCC-Historical/BCC2014/RDA\\_Best\\_Practices\\_for\\_Music\\_Cataloging.pdf](http://bcc.musiclibraryassoc.org/BCC-Historical/BCC2014/RDA_Best_Practices_for_Music_Cataloging.pdf).

Smiraglia, Richard P. 2009. “Bibliocentrism, Cultural War rant, and the Ethics of Resource Description: A Case Study.” *Cataloging & Classification Quarterly* 47 no. 7: 671–686.

Smiraglia, Richard P. 2012. “Epistemology of domain analysis.” In *Cultural frames of knowledge*, ed. Richard P. Smiraglia and Hur-Li Lee. Würzburg: Ergon-Verlag, 111–24.

Smiraglia, Richard P. 2014. *The elements of knowledge organization*. Cham: Springer International Publishing.

Tennis, Joseph T. 2003. “Two Axes of Domains for Domain Analysis.” *Knowledge Organization* 30: 191–95.

Weber, Robert Philip. 1990. *Basic Content Analysis*. Newbury Park, Calif.: Sage Publications.

Zhang, Li, and Eric Novotny. 2008. “Conference Report: Happy Trails: Building a User-Centered Online Library.” *The Serials Librarian* 5: 205–12.