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Tags in the Catalogue: Insights From a Usability Study of LibraryThing for Libraries

CARRIE PIRMAN

ABSTRACT

Library of Congress Subject Headings (LCSH), the standard subject language used in library catalogues, are often criticized for their lack of currency, biased language, and atypical syndetic structure. Conversely, folksonomies (or tags), which rely on the natural language of their users, offer a flexibility often lacking in controlled vocabularies and may offer a means of augmenting more rigid controlled vocabularies such as LCSH. Content analysis studies have demonstrated the potential for folksonomies to be used as a means of enhancing subject access to materials, and libraries are beginning to integrate tagging systems into their catalogues. This study examines the utility of tags as a means of enhancing subject access to materials in library online public access catalogues (OPACs) through usability testing with the LibraryThing for Libraries catalogue enhancements. Findings indicate that while they cannot replace LCSH, tags do show promise for aiding information seeking in OPACs. In the context of information systems design, the study revealed that while folksonomies have the potential to enhance subject access to materials, that potential is severely limited by the current inability of catalogue interfaces to support tag-based searches alongside standard catalogue searches.

INTRODUCTION

Folksonomies—user-defined labels or tags that facilitate the organization and classification of information—have evolved as a popular form of information organization on the Web. Vander Wal (2007) maintains that the value of folksonomies is rooted in “people using their own vocabulary and adding explicit meaning, which may come from inferred understanding of the information/object.” In addition to reflecting natural language, folksonomies offer a flexibility often lacking in controlled vocabularies.

Users can add new terms to a folksonomy to reflect current events or changes in the lexicon; similar changes in controlled vocabularies may take months or years to occur (Kroski, 2007; Spiteri, 2006). Due to their adaptability and flexibility, folksonomies may offer an alternative to or a means of augmenting the more rigid controlled vocabularies traditionally used in library classification systems.

Library of Congress Subject Headings (LCSH), the traditional subject language of libraries, have often been criticized for their lack of currency, biased language, and atypical syndetic structure. In their report *On the Record*, the Library of Congress Working Group on the Future of Bibliographic Control (2008) called attention to problems with LCSH, noting that its “terminology is sometimes outdated or not intuitive to the inexperienced user” (p. 34). Subject access in catalogues has been enhanced through the use of specialized controlled vocabularies (e.g., Thesaurus for Graphic Materials, Getty Thesaurus of Geographic Names); however, many accessibility issues surrounding LCSH remain. Content analysis studies (Adler, 2009; Lund & Washburn, 2009; Pirmann, 2008; Rolla, 2009; Thomas, Caudle, & Schmitz, 2009) comparing folksonomies and LCSH have demonstrated the potential for folksonomies to enhance subject access to materials. Although a sizeable number of libraries are now using tags as a means of enhancing catalogue searching, either via development of their own tagging systems (e.g., PennTags, MTagger, Social OPAC [SOPAC]) or through built-in tagging features of catalogue systems (e.g., VuFind, WorldCat Local), little research has been undertaken to determine the effectiveness of tags as a means of enhancing item discovery in library catalogues. This article summarizes a usability study of LibraryThing for Libraries, a series of catalogue enhancements that enables libraries to include tag data in their catalogue records.

LITERATURE REVIEW

First popularized through use on Web sites such as Flickr and Delicious, folksonomies and the option to create tags for online content now appear on thousands of sites—from business to news to e-commerce to blogs to social media. Libraries, archives, and museums—institutions that have traditionally relied on controlled vocabularies to describe items in their collections—have also begun to leverage folksonomies as an additional means of item description (Bearman & Trant, 2005; Trant, 2009a). Early adopters and proponents of folksonomies maintain that a distinct advantage to this system of organization is their organic development, where terms originate from the user base and are reflective of the users’ natural language (Mathes, 2004; Quintarelli, 2005; Shirky, 2005; Weinberger, 2006). Drawing on the broad range of users’ vocabularies means that folksonomies can bridge the “semantic gap” that often exists between a specialized or controlled vocabulary and the nonspecialized language of

users (Kellogg Smith, 2006). However, critics of folksonomies have pointed to the lack of vocabulary control as a significant problem. Most collaborative tagging systems lack mechanisms by which any sort of control can be applied to tags—thus leading to high numbers of synonyms, homonyms, and homographs, variations in spelling or word forms, ambiguities in word use, and other anomalies that can cause high levels of noise in a search results set (Kipp & Campbell, 2006; Macgregor & McCulloch, 2006; Peters, 2009).

Despite some disadvantages, research has demonstrated the potential for folksonomies to be used as a means of enhancing subject access to materials in libraries, archives, and museums. Content analyses of tags assigned to titles in LibraryThing and subject headings assigned to the same items (Adler, 2009; Pirmann, 2008) have revealed that folksonomies may be especially useful in augmenting descriptions of items whose content is not adequately described in LCSH (e.g., transgender or women's studies materials). The addition of folksonomies to catalogue records may also be useful for items that lack meaningful subject headings, such as works of fiction (Lund & Washburn, 2009; Mendes, Quinonez-Skinner, & Skaggs, 2009), or items for which LCSH does not reflect current terminology (Spiteri, 2006). Research focusing on art museum collections and digital photo collections has also demonstrated the potential for folksonomies to enhance subject access to items (Matusiak, 2006; Trant, 2006, 2009b).

Although research has demonstrated that folksonomies can enhance access to items that are traditionally described using controlled vocabularies, the value of folksonomies for information retrieval on a wider scale has not been researched extensively. Morrison (2008) found that folksonomies were least effective in searches for a specific item or queries requiring a short, factual answer. Since users tend to assign general tags to items, it follows that tags would not perform well for very specific queries but rather are more suited for browsing (Hassan-Montero & Herrero-Solana, 2006). In a study of tagging practices and tagging use in the MovieLens movie recommendation system, Sen et al. (2006) found that nearly half of all users indicated that tags classified as factual (e.g., action, Disney) were useful for mediating item discovery. Additional studies, such as the one presented here, can help determine the utility of folksonomies in information retrieval.

LIBRARYTHING FOR LIBRARIES

LibraryThing¹ is a social cataloguing Web site that allows users to assign descriptive metadata to books in the form of tags. This descriptive metadata has been leveraged into LibraryThing for Libraries (LTFL), a series of enhancements that can be incorporated into a library's online public access catalogue (OPAC).² The LTFL display adds a tag cloud of the most popular tags for a title to its catalogue record, and also includes

a “tag browser,” which enables users to search for tags and view lists of titles within the library’s collection that have been assigned a given tag. Tags included in the LTFL system are subject to a vetting process by a LibraryThing librarian to ensure that only tags that relate to the “aboutness” of a title are retained for inclusion in the LTFL displays (S. Green, personal communication, November 5, 2008). LTFL data associations are largely ISBN driven, meaning a title’s catalogue record must have an ISBN attached in order for LTFL data to be displayed. LibraryThing reports that as of March 2009, the overlap in titles between a public library collection and the LibraryThing database is, on average, approximately 75 percent (“FAQ: General”, 2011). The percentage of overlap for academic libraries is acknowledged to be lower, and a study at California State University Northridge found that LibraryThing data were available for 46 percent of ISBNs in the library’s collection (Mendes, Quinonez-Skinner, & Skaggs, 2009). In an academic library context, the application of LibraryThing data is also limited by the fact that many academic titles have not been tagged, or have only been minimally tagged, by users in LibraryThing. Despite these limitations, LibraryThing remains the most robust source of tagging data for books and the most widely adopted system for integrating tag data into library catalogues. Other solutions—including MTagger, PennTags, VuFind, and WorldCat Local—have yet to amass a substantial enough database of tags or tagged items to make them suitable mechanisms through which the value of tags may be evaluated.

METHODS

This study examined the utility of tags as a means of enhancing subject access and discovery of items in library OPACs through usability testing with the LTFL catalogue enhancements. Data were collected from three sources: a usability test in which participants engaged in six search and discovery tasks using an LTFL-enabled catalogue; semistructured interviews conducted following the usability test; and a demographic questionnaire administered to assess participants’ typical use of the library catalogue and familiarity with social bookmarking and tagging tools.

Usability Test

The usability test administered to participants in this study was divided into three portions: (1) open-ended (native) search, (2) known-item searches, and (3) unknown-item searches. Usability testing experts strongly encourage the design of tasks that are representative of typical user activities (Kuniavsky, 2003; Nielsen, 1993); the tasks used in this study were designed to be representative of users’ typical searches in an OPAC. All portions of the usability study were conducted using an LTFL-enabled catalogue at a major research university library. Test sessions were recorded using screen capture software (Morae) and a Web cam. Participants were encouraged

to use the “think aloud” technique (Nielsen, 1993) to articulate their experiences of searching and finding materials for the duration of the study. Rubin and Chisnell (2008) note that the “think aloud” technique is advantageous in that it allows the researcher to “capture preference and performance information simultaneously” (p. 204). This technique typically yields a substantial amount of qualitative data, even with a small test population.

In each section of the usability test (open-ended search, known-item search, and unknown-item search), participants were first directed to look at an item’s catalogue record to determine its subject and scope and then directed to find similar items in the catalogue. Detailed descriptions of the usability tasks can be found in Appendix A. In the initial task instructions, participants were not specifically directed to use the subject headings and tags to find items. As the primary focus of this research was to compare the usefulness of subject headings and tags for finding items, the researcher did point out these features to participants who did not demonstrate any inclination to use them. Immediately following the test sessions, participants were interviewed to allow them to articulate their impressions of the search and discovery process. Researchers recommend administering post-test questionnaires or interviews in usability testing as a means of “[getting] answers to specifically targeted questions . . . that may not have been answered by the user’s behavior during the test” (Prasse & Conway, 2008, p. 223). Interview questions can be found in Appendix B.

A total of thirteen participants were recruited for this study. Nielsen (2000) advocates that in usability testing, a small participant population is sufficient to uncover the majority of issues in the system being tested; a study with five participants typically will reveal approximately 85 percent of its usability problems. Due to differences in their research habits and levels of library experience, the researcher conducted sessions with both graduate and undergraduate students; seven of the participants were graduate students and six were undergraduate students.

RESULTS

Overall Searching and Finding Behaviors

On the whole, participants’ behavior in the usability test and responses to the semistructured interview questions reinforced the notion that searching is an iterative, evolving process (table 1). The most commonly observed searching behaviors in this study included browsing subject headings for relevant topics (eight participants, or 62 percent); browsing recommended titles via the LTFL display (eight participants, or 62 percent); using keywords from a title to perform additional catalogue searches (seven participants, or 54 percent); and searching using a combination of tags in the LTFL tag browser (four participants, or 31 percent).

Table 1. Prominent Searching and Finding Behaviors Exhibited by Participants across All Tasks in the Usability Study

Searching and Finding Behaviors	Number of Participants (N = 13)
Browse subject headings for relevant topics	8
Browse recommended titles in the LTFL display	8
Use keywords from a relevant title to perform additional searches	7
Search via a combination of tags in the LTFL tag browser	4

Not all participants used the subject headings or tags in each of the search tasks—rather, they engaged in an iterative process, following the access points they judged to be most useful or relevant to their query. On the surface, this may manifest as seemingly haphazard search behavior, where users are not consistent or methodical with their processes. In fact, these behaviors are truly reflective of Bates's (1989) description of the nature of evolving searches: "users may begin with just one feature of a broader topic, or just one relevant reference, and move through a variety of sources. Each new piece of information they encounter gives them new ideas and directions to follow and, consequently, a new conception of the query."

Use of Subject Headings and Tags

Participants' use of and familiarity with subject headings were fairly consistent across both the graduate and undergraduate student populations (fig. 1). In the initial open-ended search task, six graduate student participants (86 percent) demonstrated familiarity with subject headings and used them without prompting. Similarly, five undergraduate student participants (83 percent) were familiar with subject headings and used them without prompting. In the context of their typical search behaviors, participants reported varying levels of use of subject headings. Five participants (four graduate, one undergraduate) indicated that they used subject headings as a primary or initial search strategy. An additional five participants (all undergraduates) said that they "sometimes" use subject headings in catalogue searches but are more likely to use headings as a browsing mechanism. The remaining participants indicated infrequent use of subject headings, stating they were likely to use them only when other methods (e.g., keyword searching) were not effective. Although participants were generally familiar with subject headings, their use of the subject headings was not consistent across any of the tasks.

Participants' use of and familiarity with tags varied across groups. In the first known-item search task, five graduate student participants (71 percent) used tags on the catalogue records without prompting. Conversely, only three undergraduate students (50 percent) used tags without prompting. Participants who did not use the tags in the first known-item

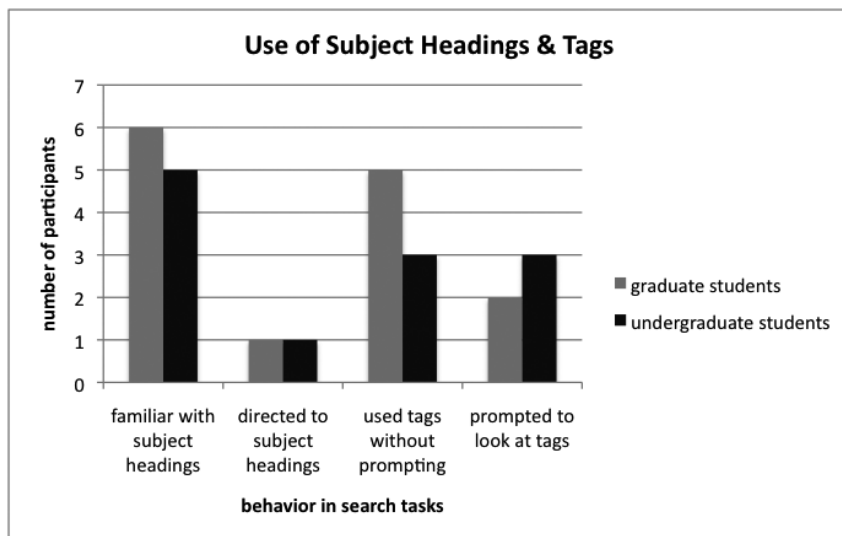


Figure 1. Participants' use of subject headings and tags in the initial search tasks. Use of subject headings is measured from the initial open-ended search task, and use of tags is measured from the first known item search task.

search task were prompted by the researcher to do so in the subsequent search task. Of the five participants who had to be directed to use the LTFI tags, three reported no prior knowledge of tagging. In the second and third known-item search tasks, only a few participants chose to use the tags as their first means of browsing for additional materials. As with the subject headings, use of tags was not consistent across any of the tasks.

Evaluations of Subject Headings

Participants articulated a number of both useful and nonuseful aspects of the subject headings (table 2). Ten participants (77 percent) believed that more specific subject headings³ provided the best support information seeking in focused or narrow research queries. Six participants (46 percent) noted that the structure of subject headings—from general to more specific—aids in the refinement of search queries. Four participants (31 percent) did recognize that general subject headings could at times be useful, especially as a means of gathering items for a broad literature review or as a starting point into researching an unfamiliar topic. Three participants also noted that subject headings are an authoritative source of terminology, as they are created and assigned by subject experts at the Library of Congress. With regard to nonuseful aspects of subject headings, eleven participants (85 percent) indicated that the general subject headings were not useful due to the large number of titles to which they are often assigned. Conversely, four participants (31 percent) found the

Table 2. Summary of the Most Commonly Cited Useful and Nonuseful Aspects of Subject Headings

Summary of Evaluations of Subject Headings	Number of Participants (N = 13)
General subject headings assigned to a large number of titles yield too many results	11
Specific headings support information seeking in more focused or narrow research queries	10
Structure of headings—from general to more specific—aids refinement of search queries	6
Relevancy of items found via subject headings is not consistent	5
Specific subject headings assigned to a very small number of titles do not yield enough results	4
General headings can give good overview of material in a subject area; serve as a starting point for researching an unfamiliar topic	4
Authoritative source of terms—assigned by Library of Congress	3

specific headings to not be useful, as in some cases a very small number of titles were assigned a heading. Finally, five participants (38 percent) commented on the relevancy of items found via subject headings, noting that searching this way did not always produce consistent results.

Evaluations of Tags

As with the subject headings, participants found there to be advantages and disadvantages to the tags (table 3). Six participants (46 percent) indicated that tags were useful in that they generated a broad list of titles, which would be helpful when doing conducting a literature survey on a topic. Six participants (46 percent) also indicated that tags were a good alternative to subject headings, as they provided more options and ideas for searching and browsing in the catalogue. Three participants (23 percent) also noted that tags could serve as a source of ideas for new terms to use in keyword searches. Participants also identified some disadvantages to tags. Nine participants (69 percent) indicated the greatest disadvantage of tags was their overwhelmingly general nature,⁴ which renders them not very useful when searching for materials on a very specific topic. Six participants (46 percent) noted that, similar to subject headings, the relevancy of items found via tags was not consistent. Four participants (31 percent) commented on the lack of authority control in tags; indeed, this is one of the most common criticisms of tagging systems.

DISCUSSION

Results of usability testing with the LTFL catalogue enhancements indicate that while tags can be a useful mechanism for finding materials in

Table 3. Summary of the Most Commonly Cited Useful and Nonuseful Aspects of Tags

Summary of Evaluations of Tags	Number of Participants (N = 13)
Tags are too general when working with specific research topic—e.g. tag “US History” leads to a list of wide-ranging titles	9
Relevancy of items found via tags is not consistent	6
Tags generate a broad list of titles, which is useful for doing a literature survey on a broad topic	6
Provide additional options for searching and browsing	6
Authority control issues: no clear definitions for tags, some appear to mean almost the same thing (e.g., environment vs. environmentalism)	4
Serve as a source of ideas for related terms to use in keyword searches	3

library catalogues, they cannot replace the more traditional subject headings. Based on their experiences in a series of information-seeking tasks, participants rated subject headings as being slightly more useful than tags as a mechanism for finding related materials in the catalogue. Seven participants (54 percent) rated subject headings as being more useful than tags, while six participants (46 percent) rated tags as being equally useful or more useful than subject headings. More revealing, perhaps, is the fact that ten participants (77 percent) felt that subject headings more easily allowed them to locate relevant items in the search tasks. This could be due to the fact that participants were more familiar with subject headings as an access mechanism; eleven participants (85 percent) reported using subject headings to find materials in the course of their normal research activities. Although the majority of participants had some familiarity with tagging, most were not actively engaged in using social bookmarking or tagging sites, and none mentioned using these sites in the context of locating library resources. The lack of familiarity with browsing or finding items via tags may have lead participants to feel more at ease and successful in their information-seeking tasks when using the more familiar subject headings.

Despite the inclination to use subject headings over tags, most participants recognized that in certain contexts (e.g., research on an unfamiliar topic; conducting a broad literature review; generating ideas for additional keyword searches), tags could serve as a useful device for locating information not found through other means. Most participants indicated that, if the option were available, they would use tags to search or browse for items in a library catalogue, and all participants believed that having tags in the catalogue could be a beneficial feature. Even those participants who were not inclined to use the tags as a means of finding research-related materials indicated they might use tags as a means of finding items for

personal reading. Some participants who experimented with searching combined tag strings in the LTFL browser noted that leveraging tags into more complex searches (e.g., searching for “climate change” and “sustainability” rather than browsing titles tagged with “climate change”) could increase their usefulness and allow for more robust ways of information seeking and discovery.

CONCLUSION AND DIRECTIONS FOR FURTHER RESEARCH

The results of this study have a range of implications for the design of information-retrieval systems. While this study demonstrated that tags can be a useful mechanism for finding materials in library catalogues, it also highlighted some of the difficulties users may have in navigating tagging systems. One concern is that tagging systems typically do not offer any solid means by which users can drill down to isolate more specific or less commonly used tags. Titles in LibraryThing may have dozens, and in some cases hundreds, of tags assigned; however, the richness of this tag data is not accessible with LTFL displaying at maximum thirty tags per title. A participant who was familiar with tagging systems noted that it could be useful if lesser-used tags were displayed or otherwise accessible. Some participants also expressed frustration with the relevancy of results generated by LTFL, finding that titles were of mixed relevancy and did not appear, in their judgment, to be sorted with the most relevant results at the beginning of the list.

Another question that has arisen from this study is, how can folksonomies be more seamlessly integrated into library catalogues? Presently, LTFL operates only as an overlay in a catalogue system; its installation does not allow for users to conduct tag-based searches through the OPAC as they would keyword, author, or title searches. Furthermore, tags are only searchable through the LTFL tag browser, and the browser is only accessible from an item record that has tag data displayed. Both VuFind and WorldCat Local permit tagging but have no search functionality through which users can access tags. The MTagger and PennTags interfaces have an option to search by tags; however, this interface is separate from that of the library catalogue search. For all the potential that tags have to enhance access to materials in library catalogues, that potential is severely limited by the inability of the interfaces to support tag-based searches alongside standard catalogue searches.

As with all usability testing, the process and results can often inform future test designs. Refinements to the current test design would call for more opportunity for participants to demonstrate their typical search strategies. Since this study was designed to investigate the efficacy of subject headings and tags as access mechanisms, the researcher pointed out these devices to participants who did not show an inclination to use them. It would be interesting to observe, if left to using their normal search strat-

egies with no researcher prompting, how long it would take participants to locate and use the subject headings and tags. The design of search tasks for future studies should also take into consideration the variability of searching patterns and allow for participants to engage more freely in their usual search strategies. Future studies may also benefit from testing across various populations. Participants in this study were all university students, most of whom were moderately familiar with conducting research in library catalogues. Users who are less experienced or who are expert searchers in the searching of library catalogues may exhibit different search strategies, particular in the use of subject headings and refinement of search queries. One possible extension of this research would be to conduct similar usability studies with (1) laypeople who are not students nor otherwise-experienced searchers of library catalogues and (2) librarians or other expert searchers of library catalogues. Comparison of results from these three distinct user populations could shed more light on the degree to which tags can effectively help users locate items in library catalogues.

APPENDIX A

Usability Test Tasks

Open-Ended (Native) Search. In this section of the usability test, participants were instructed to conduct a keyword search on a topic of personal or research interest. After finding an item relevant to their initial search, participants were asked to demonstrate or explain how they would typically go about finding similar items. This task was designed to give the researcher a sense of the various methods participants use when searching the catalogue.

Known-Item Searches. In this portion of the test, participants were directed to view the records of predetermined items in the catalogue and then find items related to each original item. The known-item search task was used to ensure that participants viewed some records that contained substantial LibraryThing tag data; fifteen tags were displayed on the catalogue record of each of the following titles:

- Zinn, Howard. *A People's History of the United States: 1492—Present*
- Goodwin, Doris Kearns. *Team of Rivals: The Political Genius of Abraham Lincoln*
- Gore, Al. *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*

Unknown-Item Searches. In this portion of the test, participants were directed to conduct a keyword search on a predetermined topic, and from the search results, find an item they felt to be relevant to the topic. From the initial item selected, participants were then directed, as in the

known-item search task, to find similar items in the catalogue. The topics searched in this task were artificial intelligence and comparative religion. Although “artificial intelligence” is a recognized subject heading, it was selected as one of the two topic searches to give participants the opportunity to contrast items found via a subject heading and via a tag where there was an exact subject heading–tag match.

APPENDIX B

Semistructured Interview Questions

1. On a 1–5 scale (1 being least useful; 5 being most useful), how useful did you find the user-assigned tags were in locating items related to your searches? How were the tags useful? How were they not useful?
2. On a 1–5 scale (1 being least useful; 5 being most useful), how useful did you find the subject headings were in locating items related to your searches? How were the subject headings useful? How were they not useful?
3. Which structure, tags or subject headings, allowed you to find similar/relevant items more easily?
4. Do you think that having user-assigned tags/recommendations in the library catalogue could be a useful feature?
5. If the option existed to search or browse by tags in the library catalogue, is that something you would use?
6. (If they said yes to using social bookmarking tools on the survey): How do you use social bookmarking tools (e.g., uploading photos on Flickr, tagging items, etc.)?

NOTES

1. As of November 2011, LTFL has over 1.4 million members, who have catalogued over 68 million books and added nearly 82 million total tags to titles in the database, making it the largest social cataloguing site in the world. See <http://www.librarything.com/zeitgeist>.
2. As of November 2011, LTFL is used by 314 libraries and library consortia, reaching over 1700 individual libraries. See http://www.librarything.com/wiki/index.php/LTFL:Libraries_using_LibraryThing_for_Libraries.
3. For the purposes of discussion in this paper, subject headings are referred to as “general” or “specific.” General headings (e.g., United States – civilization) represent a large topic, and specific headings (e.g., Greenhouse effect, Atmospheric – Government policy – United States) represent a very narrow topic.
4. LTFL incorporates the most frequently used tags for a title into its catalogue record. By and large, tags are very broad or general in scope (e.g., American history, global warming). Less frequently assigned tags tend to not show up in the LTFL display, particularly for titles that have been assigned dozens or hundreds of tags in LibraryThing.

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