

# Subject No-hits Searches in an Academic Library Online Catalog: An Exploration of Two Potential Ameliorations

Rumi Y. Graham

This paper describes a study that explored ways in which users' subject-searching problems in a local online catalog might be reduced. On a weekly basis, the author reviewed catalog transaction logs to identify topics of subject searches retrieving no records for which appropriate information resources may actually be represented in the catalog. For topics thus identified, the author explored two potential ameliorations of the no-hits search results through the use of authority record cross-references and "pathfinder" records providing brief instructions on search refinement. This paper describes the study findings, discusses possible concerns regarding the amelioration methods used, outlines additional steps needed to determine whether the potential ameliorations make a difference to users' searching experiences, and suggests related areas for further research.



The landmark series of online catalog studies sponsored by the Council of Library Resources (CLR) in the early 1980s established unequivocally that subject searching was the most popular type of online catalog search and that catalog users experienced the most difficulty with subject searches.<sup>1-2</sup> Spurred by the findings of the CLR studies, discussions and research efforts to improve subject searching in online catalogs flourished throughout the 1980s and early 1990s.

Researchers attempted or suggested ways to improve subject searching by, for example, enriching the subject content of the catalog database; enhancing browse displays and other aspects of the user-system interface; increasing the sophisti-

cation and power of the catalog search engine; and exploring user-centered rather than system-centered philosophies of, and approaches to, system design and improvement.<sup>3-19</sup> Curiously, despite the momentum built up during this period of concentrated research, the online catalog sector of the subject access research front became comparatively quiet over the subsequent decade.

## Web Solutions?

Reasons for the loss of momentum in research addressing the improvement of online catalog subject searching over the 1990s remain unclear. However, we may speculate that the slowdown was perhaps indicative of the extremely complex nature of the remaining subject -searching

---

*Rumi Y. Graham is Manager, Collections and Database Services, at the University of Lethbridge Library in Lethbridge, Alberta, Canada, and a doctoral student in information studies at the University of Toronto; e-mail: graham@uleth.ca.*

problems. Another possibility is that research efforts were diverted elsewhere toward, for instance, the development of Web interfaces to online catalogs and other information retrieval systems or the creation of new Web-based information retrieval tools and resources.

The mid-1990s emergence of Web interfaces to online catalogs heralded the commencement of significant expansions to the accessibility and content of library catalogs. For all their added reach and content breadth, however, it is disappointing that the subject-searching capabilities of Web catalogs appear to be much the same as those of pre-Web, second-generation systems.<sup>20</sup>

In a discussion of new approaches to online subject access at the end of the 1990s, Sandy Roe listed five common subject-searching problems encountered "first in the OPAC, often still in Web-based library catalogs, and certainly in general Web searching today:" The first was "no items retrieved," and the second was "too many items retrieved."<sup>21</sup> A year later, Chris Evin Long undertook a critical evaluation of subject searching in sixty Web catalogs and concluded that of the "Web-based OPACs currently in operation ... many deficiencies present in earlier generations of online catalogs have been passed down to the next generation."<sup>22</sup>

### **Subject-searching Problems in a Local Catalog**

The proposition that the problem of "no items retrieved" (hereafter referred to as no-hits searches) persists in today's Web catalogs is supported by use statistics for the University of Lethbridge library online catalog, whose existence has spanned the pre-Web and Web interface eras. This catalog had a character-based interface from its installation in 1990 up to 1997, when the library began to offer an additional Web-based interface. From 1999, the Web interface became the primary catalog interface, although the original character-based interface remained available.

The year 1999 also marked the implementation of an agreement between the University of Lethbridge and Medicine Hat College, located 200 kilometres apart in southern Alberta, to share the university's Innopac automated library system, which included the online catalog.<sup>23</sup> From 1990 to 2002, the highest percentage of all searches in this catalog most often occurred in the subject index, and the subject index consistently accounted for the highest or second-highest percentage of all no-hits searches.<sup>24</sup> Thus, conversion to a Web interface alone did not result in marked changes in the frequency of subject no-hits search results in the University of Lethbridge catalog, which remained significantly high.

### **Suppositions and Goals of the Study**

The impetus to investigate subject-searching problems in the University of Lethbridge catalog arose from three suppositions:

- Some subject no-hits searches represent topics covered in cataloged library materials that may not have been discovered by the user.
- Some subject no-hits searches may recur periodically (e.g., from semester to semester or year to year).
- Some subject no-hits search results may be preventable if different catalog responses can be engineered, leading to the retrieval of some records that future users may judge to be relevant or worth pursuing.

These suppositions gradually coalesced out of many years of gleaning indications of subject-searching problems from experiences of assisting students with their research assignments at the reference desk and from the examination of two types of transaction log data: descriptive statistics on catalog use, and the text of users' subject no-hits search terms (which the author scanned periodically).<sup>25</sup> On the one hand, we know that transaction log data alone provide no information about users' intentions or needs. That is, some searches resulting in no retrievals may be judged by the user to be successful because the no-hits results were





Thus, enhancement 2 was developed as a more direct means of leading users to potentially relevant records when appropriate single LCSHs could not be found. It involved the adaptation of the bibliographic record format to serve as a "pathfinder" record, defined here as a brief record whose purpose is to provide instructions on how to conduct two-step searches on particular topics. The authority record format is unable to perform the function of a pathfinder record because it does not support the direct presentation of search instructions to catalog users when a field containing an authorized heading is not present.

For each no-hits search interpreted to be intelligible, the author determined whether application of enhancement 1 or 2 could lead to the retrieval of at least one potentially relevant record, but not too many. However, what constitutes "too many" is a situation-specific and subjective judgment that can be made only by the user and varying suggestions are found in the research literature on the number of retrievals that users consider to be too many.<sup>45</sup> Lacking

empirical data on what University of Lethbridge catalog users considered to be too many records retrieved, the author attempted to minimize information overload for users by adding database enhancements resulting in fewer than 100 records retrieved, whenever possible.<sup>46</sup>

The author recognized that, on the one hand, regarding the two enhancements as true improvements to the database is easily challenged because both involved significant deviation from standard subject cataloging practice. On the other hand, the purpose of exploring nonstandard uses of authority and bibliographic records was to support the main goal of subject cataloging, which is, in the author's view, the effective communication of the main subject matter of documents to catalog users. When we suspect that a significant proportion of users' needs may not be adequately met, it is legitimate to consider alternatives to current cataloging practices and policies in order to serve catalog users better. Limitations represented by the nonstandard nature of the two database enhancements

FIGURE 1  
Enhancement 1 Example

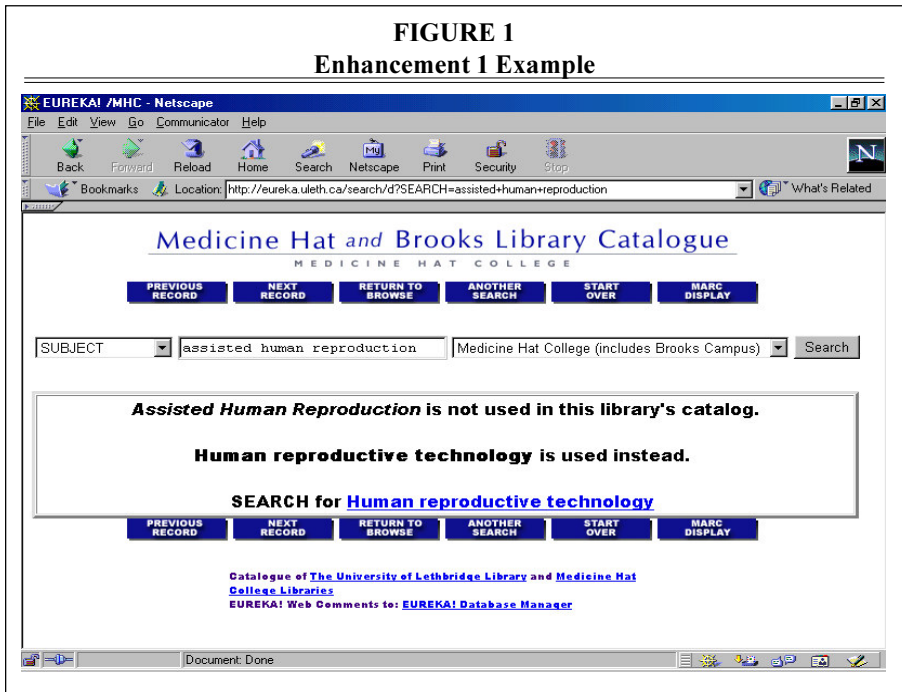
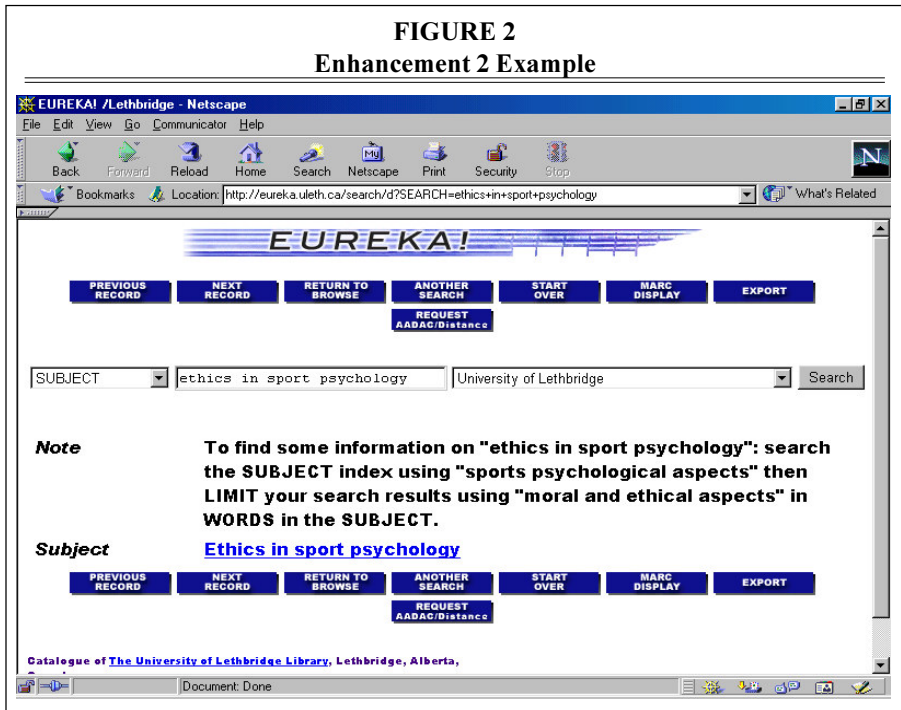


FIGURE 2  
Enhancement 2 Example



explored in this study are further considered in the discussion section.

### Database Enhancement Examples

“Assisted human reproduction” is an example of a subject no-hits search result that was modified using enhancement 1. This search was logged in the Medicine Hat College subset of the shared University of Lethbridge catalog on March 20, 2002. Before modifications were made, the catalog response to this search was a “nearest neighbors” browse display, with the highlighted message “Your entry *assisted human reproduction* would be here – *Search as Words.*”

If the user selected the option to “Search as Words,” the catalog would have automatically reexecuted the search for “assisted human reproduction” in the keyword index, where some records may have been retrieved and perhaps judged by the user to be useful. Hence, it is possible that the user judged the outcome of this no-hits search to be successful, although transaction log data show that the “Search as Words” option is rarely used.

Changing the database using the enhancement 1 methods involved adding “assisted human reproduction” as a cross-reference to the subject authority record for “human reproductive technology.” “Human reproductive technology” is an LCSH that was interpreted by the author to be similar in meaning to assisted human reproduction and was present in at least one catalog record in the database. After this database enhancement was made, searching the subject index for assisted human reproduction invoked a new system response illustrated in figure 1. As long as at least one bibliographic record containing a subject heading beginning with “human reproductive technology” continues to exist in the catalog, if a user encountering the display in figure 1 clicks on “Human reproductive technology,” the catalog automatically performs another subject search that retrieves all records containing this LCSH.

An example of enhancement 2 is found in the “before” and “after” catalog responses to the subject search for “ethics in sport psychology,” which was logged



















subject searches could be monitored via transaction logs, and no-hits searches could be enhanced, when possible, using the methods described in the present article. Thus, interviews could include discussion of particular subject no-hits searches as well as users' views on whether subsequent catalog database enhancements are useful in the context of their particular information-seeking task.

### *Related Research Questions*

In addition to further evaluative research, other issues have emerged from this exploratory study that may be worthy of investigation. For example, it has been suggested that in online catalogs, information overload (retrieving too much) and search failure (retrieving nothing) can be equally problematic.<sup>56</sup> Although captured in past transaction log reports, data on differences in retrieval set sizes across the University of Lethbridge catalog's various search indexes have not been analyzed longitudinally. However, an examination of the retrieval set sizes for the one-week sample from March 18–24, 2002, showed that although at least 80 percent of searches in all indexes retrieved fewer than a hundred records, the highest frequency of searches retrieving a hundred or more records occurred in the subject index (20%). Determining the extent of information overload could be achieved through a retrospective analysis of retrieval set sizes by index over the years. It also may be useful to determine whether information overload and search failure have been correlated in this catalog by comparing retrieval set size and no-hits search frequency patterns across the different search indexes.

Two other questions about subject searching in online catalogs are worthy of further investigation:

- How does an individual user's subject-searching behavior and cognitive processes change over time as catalog searching experience is acquired?
- What types of subject-searching enhancements might be suggested by answers to the preceding question?

Larson noted that "a longitudinal study of a set of users from their first introduction to the online catalog through one or two years of use, using transaction monitoring to record search behavior, and questionnaires and interviews to trace changing attitudes and needs" is one way to address questions that are not directly answerable using transaction log data alone.<sup>57</sup>

### **Conclusions**

Because the University of Lethbridge and its partner, Medicine Hat College, are primarily undergraduate institutions, on a continuing basis, many users of their shared library catalog are novices. We know that novice catalog users most often search the subject index, that library users in general have little understanding of the LCSHs that comprise the controlled vocabulary used in the catalog's subject index, and that users experience the most difficulty searching the subject index, which is frequently manifested in high proportions of no-hits searches.<sup>58–60</sup> Thus, finding ways to improve the subject-searching experiences of users of this shared catalog by, for example, reducing the frequency of subject no-hits search results, is of particular concern.

Database enhancements 1 and 2 explored in the present study may have contributed to the slight reduction in the proportion of subject no-hits search results observed from 1999 to 2002, which occurred at a time when the proportion of subject searches logged as no-hits searches would otherwise have been expected to remain constant after expansion of the catalog's primary user community in 1999. However, the more significant question of whether these database enhancements actually make a difference to users' subject-searching experiences requires further research.

If the present study's methods of enhancing subject searching are shown to be beneficial to users' subject-searching experiences, a reexamination of aspects of standard cataloging practice may be worthwhile. Current policy governing the









