

Identifying Significant Changes in Serials with Title Changes in the Recognition of New Works

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The purpose of the study was to develop a means for identifying significant subject and function changes in serials with title changes and then to recommend ways to recognize new serial works in cataloging. A sample of serials with title changes was used to classify the underlying subject and function changes found into thirty-five subcategories, which were then each assigned a level (high, medium, or low) according to the evidence provided for a new work. The FRBR (Functional Requirements for Bibliographic Records) concept of a work and other FRBR guidelines were used in assigning the levels. It was determined that three high-level subject changes and one high-level function change provided the best evidence of significant change in recognizing a new work. Tests were performed to determine whether multiple medium-level changes could also be used to identify new works. A recommendation was made to modify the RDA (Resource Description and Access) rules for major change in the title proper of a serial to require a new access point only when a significant subject or function change has occurred in one of the four high-level subcategories identified in the study.

A dilemma for serials catalogers over the years has been the issue of how to treat title changes. When the Anglo-American Cataloguing Rules (AACR2) were revised in 2002, the initial goal was to provide rules requiring new records for serials with title changes only if the serial had become a new work.¹ However, the mechanisms developed to recognize new works fell short of this objective. With the new Resource Description and Access (RDA) cataloging rules now replacing AACR2 in many libraries, the problem continues, since RDA employs many of the same procedures as AACR2. However, RDA emphasizes the concept of a work because the rules are based on the FRBR (Functional Requirements for Bibliographic Records) conceptual model in which a work plays a prominent role. The work is one of four key entities that represent different aspects of a user's interest in bibliographic data.² A work in RDA is defined, as in FRBR, as "a distinct intellectual or artistic creation."³

In AACR2, new works are recognized by creating new entries for the manifestations of the new works,⁴ whereas RDA represents new works by new access points, along with entries for the new manifestations.⁵ The mechanism for recognizing new works in both AACR2 and RDA consists of determining that a major change has occurred, such as certain changes in the words of the title. The major

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Submitted November 2, 2012; tentatively accepted pending modest revisions December 5, 2012; revision submitted December 29, 2012, and accepted for publication.

changes that are identified, however, do not correlate with the changes that would be recognized if using a definition of a work that explains what a work is and how it can be recognized. Thus there is no assurance that the new entry or access point will represent a new work.

In a previous study, the author developed a preliminary procedure for recognizing new works for serials with title changes, using the FRBR definition of a work and additional FRBR guidelines.⁶ The study found that only two kinds of changes, namely, subject changes and function changes, provide the evidence needed to recognize a new work. The FRBR requirement that a significant change must occur was not addressed, this being beyond the scope of the study.

There is a need to address the issue of significant change in serials with title changes. The current study, a follow-up to the study noted above, will consider this problem and attempt to develop a means by which significant subject and function changes can be identified. Knowing how to discern significant changes in serials will provide a tool that could improve cataloging rules for serials. No study was found that addressed this issue.

The purpose of the study is to develop a means for identifying significant subject and function changes in serials with title changes and to recommend changes in cataloging rules for recognizing new serial works. The study was limited to serials that had title changes and did not address other kinds of changes in serials (e.g., changes in responsibility) that might also lead to the recognition of a new work. The study is expected to contribute to the theoretical body of knowledge concerning serials with title changes. It also will have a practical application in providing data that can be used to improve cataloging rules, specifically the RDA rules.

Literature Review

The literature review was concerned with three areas relating to the proposed research: (1) how to define a serial work, (2) how cataloging rules determine when a new record or access point should be created for a serial with a title change, and (3) the characteristics of serials with title changes.

Concept of a Work in the Library Catalog

There are various views on how to define a work for the library catalog, as well as differences in how cataloging rules treat this issue. AACR2 does not provide a definition of a work, whereas in RDA the FRBR definition is used. The FRBR conceptual model, on which RDA is based, was developed by a study group of the International Federation of Library Associations and Institutions (IFLA) which published a report titled *Functional Requirements for*

Bibliographic Records. The report includes the following background on the concept of a work:

A work is an abstract entity; there is no single material object one can point to as the work. We recognize the work through individual realizations or *expressions* of the *work*, but the *work* itself exists only in the commonality of content between and among the various *expressions* of the *work*. Because the notion of a *work* is abstract, it is difficult to define precise boundaries for the entity. The concept of what constitutes a work and where the line of demarcation lies between one *work* and another may in fact be viewed differently from one culture to another.⁷

The difficulty in coming to a common agreement on what constitutes a work is seen in the different views expressed in a special issue of *Cataloging & Classification Quarterly* that was devoted to the concept of a work in the modern catalog.⁸ Smiraglia, editor of the volume, also wrote a subsequent article in which he identifies critical elements of definitions of works by authors from Panizzi (1841) and onward.⁹ Views on the more specific concept of a serial work have been proposed by some authors, with an overview of some of these views following.

Some have taken a strong stand on the importance of the user's perceptions and needs in creating guidelines for recognizing new serial works. Layne and Antelman both note that neither the librarian nor library users would see a new work in the records created by cataloging rules.¹⁰ Antelman suggests that a new work identifier is needed for serials, since neither name nor title are reliable identifiers of a serial work. She proposes the concept of bibliographic families to group records for related serials in the library catalog.¹¹

Yee and Kuhagen voice similar concerns, with Yee suggesting that not only could the title and author change, but the intellectual and artistic content could be changed without the serial becoming a new work.¹² She proposes: "As a rule of thumb, consider two items to be the same work if they would be considered interchangeable by most users, or if a user seeking one would actually find the other preferable (as in the case of a later revised edition)."¹³ Kuhagen suggests that users' needs in finding and selecting serials would be best supported if serials with changed titles were treated as single works, whereas mergers and splits could be treated as different works.¹⁴

Adams and Santamauro take an approach similar to Antelman's, proposing that instead of identifying works, one should identify superworkexpressions.¹⁵ This concept, derived from FRBR principles, draws on the work of Frieda Rosenberg and Diane Hillman.¹⁶ Adams and Santamauro suggest that an umbrella record could be created for each

superworkspression, containing all of the bibliographic information pertaining to the resource regardless of format. Manifestation records, specific to particular formats, would stem from the umbrella record, with item records branching off from the manifestation record. The authors propose doing away with the current practice of successive entry cataloging, which requires a new record for every major change in title or format. New umbrella records would be created only when there has been a change in content. The authors acknowledge that it may prove difficult to determine when content has changed sufficiently to identify a new superworkspression.¹⁷

History of Serials Cataloging Rules

There has been a move, as cataloging rules have been revised, to require a new record or access point only when a new work has emerged. However, cataloging rules do not always include the guidance that could be provided by a specific definition of a work. A brief overview of the major cataloging conventions used for serials follows.

Hirons provides a succinct description of the three conventions that have been used historically for cataloging serials:

- Earliest entry: all changes are kept on a single record with the description based on the earliest issue and title changes, etc. recorded in notes;
- Latest entry: all changes are kept on a single record with description based on the latest (most recent) issue and earlier titles, etc. given in notes;
- Successive entry: a new record is made for each title or other major change (e.g., main entry); description is based on the latest issue (AACR1) or the earliest issue (AACR2).¹⁸

As Jones notes, different works will be identified for the same serial, depending on which of these conventions is applied.¹⁹

Both RDA and AACR2 are based on the concept of successive entry.²⁰ There is continuing debate, however, on the merits of successive entry cataloging versus maintaining a single record or access point for serials with title changes. A special concern with successive entry is that excessive numbers of records or access points are often required. The single record approach is proposed by Lim as a way to limit the number of records created, with the suggestion that separate records be created for titles resulting from mergers or splits.²¹ Hirons and Graham believe that successive entry cataloging fills a need, but propose that new records be created only when there has been a substantial change in the serial.²² The pros and cons of successive versus latest entry cataloging are discussed in a collection of articles, edited by

Mary Curran and titled “Mission Accomplished? A Symposium on Latest vs. Successive Entry.”²³ The four contributors conclude that a system solution is needed, either via FRBR or a next-generation catalog.

Characteristics of Serials with Title Changes

Cataloging rules, as noted above, employ varying procedures for determining when new records or access points should be created for serials with title changes. Before procedures can be developed, however, it seems that one must understand the changes that occur in serials when a title changes, so the procedures can specify the kinds of changes that would warrant the recognition of a new work. In a previous article, the author identified several studies that investigated the reasons for serial title changes, but found that none of the studies looked at how the information could be used to inform the task of creating or revising cataloging rules. A research study was therefore conducted by the author to identify the characteristics of serials with title changes, with the goal of providing input for improving cataloging rules.²⁴ It was determined that 80.8 percent of the underlying changes that occur in serials with title changes are for subject or function changes. It was further determined that to identify new works for serials with title changes, using the FRBR concept of a work as a guide, a significant subject or function change must occur. The recognition that significant change must occur correlates with a comment by Adams and Santamauro that a sufficient change in content is needed for a new superworkspression record to be created.²⁵ How to recognize significant change in serials is a topic not addressed in these studies.

Summary of the Literature

In summary, there are differing views on what constitutes a serial work. Cataloging rules likewise differ in how a serial work is viewed, with some cataloging codes providing no definition of a work and no rationale for the access points and entries that are created. Some individuals who have commented on this issue believe that new records and access points for serials with title changes should be created only when there has been sufficient or substantial change in the serial. How to identify substantial change in a serial has not been addressed in the literature.

Method

Conceptual Framework

The purpose of the study was to develop a means for identifying significant subject and function changes in serials with

title changes and then to recommend changes in cataloging rules for recognizing new serial works. The research was descriptive and exploratory. The RDA definitions of a work and of a serial were used. Thus, a serial was defined as “a resource issued in successive parts, usually bearing numbering, that has no predetermined conclusion (e.g., a periodical, a monographic series, a newspaper).”²⁶ A work, as previously noted, was defined as “a distinct intellectual or artistic creation (i.e., the intellectual or artistic content).”²⁷ This definition corresponds with the definition used in the FRBR model that forms the conceptual basis for the RDA rules.²⁸ A subject change was defined as “a change in the serial’s topical content” (e.g., a change from zoology to biology). A function change, in turn, was defined as “a change in the serial’s character or purpose” (e.g., a change from a bulletin to a journal).

The goal of developing a means for identifying significant subject and function changes in serials with title changes was achieved by seeking answers to three questions:

- First, what are the broad subcategories into which subject and function changes in serials with title changes can be divided? It was assumed that the subcategories would provide a broad grouping of the kinds of changes that occur in serials with title changes. The subcategories could then be evaluated in the subsequent step.
- Second, what level of evidence is provided by each subcategory of subject and function change in recognizing a new serial work? It was expected that the assignment of a level to each subcategory would enable one to know how the changes represented by the subcategory would contribute to the recognition of a new work, with higher level changes contributing most. This information would provide a tool that could be used in the next step.
- Third, which of the subcategories, or combinations of subcategories, of subject and function change would provide evidence of a significant change, needed to recognize a new serial work? It was anticipated that the information gathered above could be used to develop various approaches for recognizing new works. An assumption was made that the approaches for identifying new works must be practical and cost effective, due to limited cataloging budgets.

In summary, the research questions were:

- What are the broad subcategories into which subject and function changes in serials with title changes can be divided?
- What level of evidence is provided by each subcategory of subject and function change in recognizing a new serial work?

- Which of the subcategories, or combinations of subcategories, of subject and function change provide evidence of a significant change, needed to recognize a new serial work?

Sample

The sample used in the study was from the author’s previous study of serials with title changes mentioned above. This sample was chosen so the current study could enlarge on the recommendations made in the previous study. The sample was taken from JSTOR—short for Journal Storage (www.jstor.org)—an online database archive of full-text digitized back issues of academic journals, including various kinds of serials, such as bulletins, reviews, annuals, newsletters, yearbooks, and proceedings. Four JSTOR collections were included in the sample: Arts and Sciences I, Arts and Sciences II, Arts and Sciences III, and Life Sciences. These collections covered a variety of disciplines, including the humanities, social sciences, language, literature, and life sciences. Non-English serials were excluded, as were serials consisting of splits or mergers, since the latter were already considered to be different works and did not require further analysis. Serials for which no explanation of the title change was found in the text were also excluded, leaving 120 serials. In the current study, only the serials in which a subject or function change occurred, relevant to the title change, were considered. This caused twenty-three serials to be excluded, leaving ninety-seven serials in the final sample. The majority of the resulting serials were from the 1900s. A list of the serials is found in appendix A, by the title to which the serial was changed. Due to the nature of the sample, with a focus on academic serials, there may be limitations in generalizing the findings.

Procedure for Identifying Subject and Function Subcategories

The first research question was (A): What are the broad subcategories into which subject and function changes in serials with title changes can be divided? To answer this question, the descriptions of why titles change, identified in the previous study, were used. These descriptions were derived from statements occurring in the text of the serials. For example, the reason for a title change might have been due to a broadening of the subject content (e.g., from zoology to biology), or a change in function (e.g., from a newsletter to a journal). Some descriptions were reworded to create consistency for better grouping of the descriptions. Only the 179 descriptions relating to subject and function changes were examined. The following steps were performed:

1. Identified subject subcategories

- Created a list of all descriptions pertaining to subject changes in the serials
- Grouped the descriptions into subcategories based on the wording and intent of the descriptions (see appendix B)
- 2. Identified function subcategories
 - Created a list of all descriptions pertaining to function changes in the serials
 - Grouped the descriptions into subcategories based on the wording and intent of the descriptions (see appendix C)

In the initial attempt to develop subcategories for the subject and function changes, broad groupings were created, consisting of eight to ten subcategories of subject changes and eight to ten subcategories of function changes. The wording of the descriptions was used as much as possible to create the groupings. The resulting subcategories were later subdivided further so finer distinctions could be made, allowing greater flexibility for the evaluation of the subcategories in the following step.

Some descriptions did not group well with other descriptions. New subcategories were created for some of these unique descriptions, if the descriptions were different enough to warrant separate subcategories. Other unique descriptions were grouped with descriptions that seemed to represent a similar intent. The remaining unique descriptions were placed in a miscellaneous subcategory, along with a few general descriptions that described “new” or “additional” features. If a description referred to more than one type of change, the description was assigned to the subcategory corresponding with the first change mentioned, unless a subsequently described change was more specific.

Procedure for Assigning Levels to the Subcategories

The second research question was (B): What level of evidence is provided by each subcategory of subject and function change in recognizing a new serial work? To answer this question, the subcategories were classified according to the expected value of the changes in identifying a new work. The following steps were performed:

1. Assigned a level to each subject subcategory
 - Developed guidelines for assigning levels to the subject subcategories:
 - High-level: (1) changed overall content of the serial
 - Medium-level: (1) added or deleted certain subjects, (2) changed overall emphasis or focus, (3) increased/decreased emphasis on certain subject(s), or (4) brought title into harmony with the content of the serial

- Low-level: (1) brought title into harmony with the stated scope of the serial
 - Assigned a level to each subject subcategory, along with a code (e.g., S1.1 for high, S2.1 for medium, S3.1 for low)
 - Entered a code for each description associated with each serial in appendix A (column 3)
- 2. Assigned a level to each function subcategory
 - Developed guidelines for assigning levels to the function subcategories:
 - High-level: (1) changed overall function of the serial
 - Medium-level: (1) added or deleted certain types of articles, (2) increased/decreased emphasis on certain types of articles, or (3) brought title into harmony with the types of articles published in the serial
 - Low-level: (1) added, deleted, or changed sections or features in the serial
 - Assigned a level to each function subcategory, along with a code (e.g., U1.1 for high, U2.1 for medium, U3.1 for low)
 - Entered a code for each description associated with each serial in appendix A (column 3)
- 3. Assigned a primary level to each serial
 - Assigned a primary level (high, medium, or low) to each serial, based on the highest level subcategory associated with the serial
 - Recorded a term (high, medium, or low) for the primary level assigned to each serial in appendix A (column 4)

The FRBR guidelines for modified works, requiring a significant degree of change to recognize a new work, provided the basis for assigning the levels to the subcategories. The guidelines, developed by an IFLA Study Group on the Functional Requirements for Bibliographic Records, state: “By contrast, when the modification of a *work* involves a significant degree of independent intellectual or artistic effort, the result is viewed, for the purpose of this study, as a new *work*.”²⁹ Though the guidelines were not intended specifically for serials, the idea that significant effort or change must occur to recognize a new work was assumed to apply to any resource that has undergone change.

The task was to determine the kinds of subject and function changes that would be significant versus those that would not be significant. Five levels were used initially, but this proved to be too specific, so three levels were used, which seemed sufficient to distinguish the subcategories. It was envisioned that the high-level subcategories would represent major changes, the medium-level subcategories would represent moderate changes, and the low-level subcategories would represent minor changes.

Procedure for Recognizing New Works

The third research question was (C): Which of the subcategories, or combinations of subcategories, of subject and function change provide evidence of a significant change, needed to recognize a new serial work? To answer this question, three approaches were developed, using the sampled serials to test each approach. The primary approach consisted of identifying serials with high-level subject or function changes. If a high-level change did not occur, two alternate approaches were tried, involving the identification of serials with medium-level subject or function changes. The steps taken with each approach are described below.

1. Primary approach: Identified high-level subject and function changes
 - Identified all serials in appendix A (column 4) for which a high-level subject or function change occurred
 - Determined the total number of serials for which a high-level change occurred
2. Alternate approach (1): Identified multiple medium-level subject or function changes
 - Identified all serials in appendix A (column 3) that had multiple medium-level subject or function changes and no high-level change
 - Developed tests to determine which serials with multiple medium-level changes were potentially new works
3. Alternate approach (2): Identified successive medium-level subject or function changes
 - Identified all serials in appendix A that had a succeeding title change
 - Identified the serial sets that met the following conditions: (1) neither of the serials in the set had a high-level change or multiple medium-level changes, and (2) each serial in the set had a single medium-level change
 - Developed tests to determine which serials with successive title changes were potentially new works

It was assumed that the identification of high-level changes, in the primary approach above, would provide sufficient evidence for a new work, with no further testing required. However, for the alternate approaches, which used medium-level changes as evidence, a means was needed to determine whether the combined changes could be considered significant. Two tests were developed to evaluate these changes. The first test required three medium-level subject or function changes to occur, in any combination. The second test required two prioritized medium-level subject or function changes to occur. A list was created of medium-level subcategories representing prioritized changes, including

four subject subcategories and four function subcategories. An attempt was made in creating the list to identify the subcategories that represented the greatest amount of change. The list was intended as a preliminary list, with modifications anticipated as the procedure was implemented and evaluated. The subcategories were the following:

- S2.2—Broadened content to include other subjects
- S2.5—Changed overall emphasis or focus
- S2.7—Narrowed content
- S2.9—Brought title into harmony with content of serial
- U2.9—Increased emphasis on original, scientific, or conceptual articles
- U2.10—Increased emphasis on the peer review process
- U2.11—Narrowed the article selection policy
- U2.13—Brought title into harmony with types of articles published

Results

The findings from the study are reported here, relevant to the three tasks that were performed: (A) identifying subcategories, (B) assigning levels to the subcategories, and (C) developing procedures for recognizing new serial works.

Identifying Subcategories

The 179 descriptions of subject and function changes associated with the ninety-seven serials in the sample were grouped into thirty-five subcategories. The grouping resulted in the creation of thirteen subcategories pertaining to subject changes and twenty-two subcategories relating to function changes. The subject subcategories are listed in appendix B, along with descriptions of the associated subject changes, and the function subcategories and descriptions are listed in appendix C. There were eighty descriptions of subject changes in the sample and ninety-nine descriptions of function changes.

Assigning Levels to the Subcategories

Each subject and function subcategory identified above was assigned to one of three levels: high, medium, or low. Table 1 lists the subject subcategories assigned to each of the three levels, with table 2 listing the function subcategories assigned to each level. The eighty descriptions of subject changes were assigned as follows: twenty-one descriptions were assigned to a high-level subcategory, fifty-four to a medium-level subcategory, and five to a low-level subcategory. The ninety-nine descriptions of function changes were

assigned as follows: seventeen descriptions were assigned to a high-level subcategory, forty-five to a medium-level subcategory, and thirty-seven to a low-level subcategory.

A primary level was assigned to each serial, based on the highest level subject or function subcategory associated with the serial. Over a third of the serials (36.1 percent) were classed with a primary level for a high-level change, over half (57.7 percent) with a primary level designating a medium-level change, and less than a tenth (6.2 percent) with a primary level for a low-level change.

Developing Procedures for Recognizing New Serial Works

The findings from the foregoing tasks were used to develop procedures for recognizing new serial works. Three approaches were developed, including a primary approach and two alternate approaches. The serials in the sample were used to test each approach, with the results from the testing described below.

The primary approach for recognizing a new serial work consisted of identifying a high-level subject or function change in the serial. Tables 1 and 2 contain respective displays of the high-level subcategories of subject and function changes found in the study. The descriptions associated with each subcategory are listed in the appendixes, with appendix B providing descriptions of the high-level subject changes and appendix C providing descriptions of the high-level function changes. The ninety-seven serials in the sample had thirty-five changes falling into a high-level subject or function subcategory, not counting three duplicate changes. Two serials (no. 85 and no. 95) had subject changes falling into two different subcategories. Also, one serial (no. 1) had both a high-level subject change and a high-level function change. When excluding the duplicate subject changes, about half of the high-level changes (nineteen) were subject changes, and the other half (seventeen) were function changes. Close to a third (29.2 percent) of the 120 serials in the original sample, from which the current sample was taken, were identified as new works using the foregoing approach.

The first alternate approach that was tried for identifying new works considered the evidence provided by multiple medium-level changes in the serials. Only those serials were examined that were not already identified with a high-level

Table 1. Subject Change Subcategories by Level of Evidence

Code	Subcategories by Level of Evidence	No. of Descriptions
HIGH		
S1.1	Changed overall subject content	5
S1.2	Broadened content to a more inclusive field(s) of study	7
S1.3	Broadened geographic coverage	9
	Subtotal	21
MEDIUM		
S2.1	Added a subject(s)	9
S2.2	Broadened content to include other subjects	8
S2.3	Broadened content with more varied coverage	7
S2.4	Changed content to reflect developments in the field	9
S2.5	Changed overall emphasis or focus	4
S2.6	Increased emphasis on a subject(s)	9
S2.7	Narrowed content	1
S2.8	Stopped covering a subject(s)	2
S2.9	Brought title into harmony with content of serial	5
	Subtotal	54
LOW		
S3.1	Brought title into harmony with stated scope of serial	5
	Subtotal	5

change. Of the sixty-two serials not identified with a high-level change, seventeen had multiple medium-level changes. A total of forty-four medium-level changes occurred in the seventeen serials, including nineteen function changes and twenty-five subject changes. For close to two-thirds of the serials (eleven), two medium-level changes occurred, and for close to one-fourth of the serials (four), three medium-level changes occurred. The remaining two serials had four or six medium-level changes each.

To evaluate this approach, two tests were developed to set limits on the combination of medium-level changes that would qualify a serial as a new work. The results from applying Test 1, requiring three medium-level subject or function changes to occur, are found in table 3. This test resulted in six of the seventeen serials qualifying as new works. The results from applying Test 2, requiring two prioritized medium-level subject or function changes to occur, are reported in table 4. This test resulted in three of the seventeen serials qualifying as new works. More new works were thus identified with the first test. The new works identified with each test were different, except for one serial (no. 112) which qualified under both tests.

The second alternate approach used to identify new works considered the evidence provided by cumulative change in serials that had a succeeding title change. The

sample included nine sets of serials with a succeeding title change, with each set consisting of two title changes. The goal was to identify any set for which new works had not already been identified with the previous approaches. The sets are listed in table 5. Two sets were eliminated due to a high-level change occurring in one or both of the serials in the set. Three additional sets were eliminated because at least one of the serials had multiple medium-level changes. In the one remaining set (set 6), there was a single medium-level change in each of the serials comprising the set.

To evaluate this approach for its value in identifying new works, Test 2, above, requiring two prioritized changes to occur, was used. Test 1, requiring three medium-level changes to occur, could not be used since only two changes occurred in the set. When applying Test 2, both of the changes that occurred qualified as prioritized changes, as follows:

S2.2—Broadened the scope of the Federation and the Journal to cover all waste control problems, including more space given to industrial waste papers in relation to papers on municipal sewage works problems (no. 114)

S2.2—Broadened responsibility of the Federation and the Journal to cover water pollution control (no. 113)

Summary of Results

A summary of the results when applying the three approaches to recognize new works is provided in table 6. The primary approach, using only high-level subject or function changes to recognize a new work, resulted in thirty-five new works being identified in the ninety-seven serials examined. When also using the two alternate approaches, the number of new works potentially identified increased. The first alternate approach, requiring multiple medium-level changes to occur, resulted in either four or seven additional new works being identified, depending on which limiting procedure was used. The second alternate approach, requiring cumulative medium-level changes to occur over a range of title changes, resulted in one additional new work being

Table 2. Function Change Subcategories by Level of Evidence

Code	Subcategories by Level of Evidence	No. of Descriptions
HIGH		
U1.1	Changed overall function of serial	17
	Subtotal	17
MEDIUM		
U2.1	Began including authoritative articles on special topics	2
U2.2	Began including commentaries	3
U2.3	Began including conference or symposia papers or plans	3
U2.4	Began including literature reviews or review articles	9
U2.5	Began including non-conference articles	2
U2.6	Began including reports	2
U2.7	Began publishing original, scholarly, or research articles	9
U2.8	Developed or expanded upon a function	4
U2.9	Increased emphasis on original, scientific, or conceptual articles	3
U2.10	Increased emphasis on the peer review process	4
U2.11	Narrowed the article selection policy	1
U2.12	Stopped including a function	1
U2.13	Brought title into harmony with types of articles published	2
	Subtotal	45
LOW		
U3.1	Added a bibliography section	2
U3.2	Added a book review section	2
U3.3	Added a commentary, discussion, or debate section	7
U3.4	Added a correspondence section	4
U3.5	Added a news section	3
U3.6	Added a notes section	4
U3.7	Added abstracts, resumes, or other new features	5
U3.8	Changed or updated a section or feature	10
	Subtotal	37

identified. If using all three approaches, a maximum of forty-two of the ninety-seven serials were potentially identified as new works. When considering the original sample of 120 serials, the percent of serials potentially identified as new works using the primary approach was 29.2 percent (35/120), and when using the two alternate approaches the percent increased to a maximum of 35.0 percent (42/120).

Discussion of Findings

This study was different from previous studies of serials with title changes in that the focus was on subject and function changes, rather than on the full array of changes that might

Table 3. Medium-Level Changes: Minimum of Three

Sample No.	Codes	Descriptions of Change
18	U2.1	Began publishing an authoritative article each month on a problem confronting the Institute
	U2.2	Began publishing opinion translations on issues between East and West
	U2.3	Began including presentations of conference problems and plans
	U2.8	Began including more comprehensive and valuable materials, but still within the realm of a news bulletin
25	S2.6	Increased emphasis on American archaeology
	U2.6	Began publishing various reports, including annual reports, of the Institute and the School at Athens
	U2.9	Began publishing more scientific papers
39	S2.4	Changed content to resonate with the far-reaching transformations taking place in the Americas
	S2.5	Began promoting a reexamination of prevailing social science theory and concepts about Latin America and the Caribbean
	S2.6	Increased emphasis on interdisciplinary studies, including comparative, cross-regional perspectives
59	S2.1	Began covering the cognate sciences
	S2.4	Broadened content to match the enlarged scope that the term Folklore has reached and the enlarged [non-folklorist] readership that is anticipated
	U2.6	Began including special reports on recent research in the cognate sciences [as related to folklore]
103	S2.4	Changed focus to reflect today's occupational and environmental health problems
	S2.6	Increased emphasis on environmental medicine
	U2.8	Expanded the educational function of the journal to include articles on issues of current importance, as well as methodological papers
112	S2.2	Expanded coverage to include research on hazardous wastes, groundwater contamination, waste minimization, and environmental risk and health
	U2.4	Added an annual literature review issue
	U2.4	Began including State-of-the-art reviews of scientific and technological issues
	U2.7	Began including four types of papers: (1) RESEARCH PAPERS, (2) RESEARCH NOTES, (3) DISCUSSIONS, and (4) DISCUSSION CLOSURES
	U2.10	Began enhancing the rigor of the manuscript review process
	U2.10	Placed manuscript acceptance decisions under the control of a Board of Editorial Review, to enhance the stature of the Journal in all water quality areas

Table 4. Medium-Level Changes (Prioritized): Minimum of Two

Sample No.	Codes	Descriptions of Change (Prioritized)
52	S2.2	Broadened content to include art education (providing information, presenting theories and criticisms, announcing opportunities and resources, and promoting discussion relating to art education)
	S2.2	Broadened discussion beyond problems concerning the history of art [a major purpose of journal is discussion]
66	U2.9	Increased preference for original contributions on treatment and research in all branches of the theory and practice of the conservation of cultural property, as well as contributions in art history and science
	U2.10	Increased emphasis on the peer review process by excluding preprint volumes as published volumes of the journal
112	S2.2	Expanded coverage to include research on hazardous wastes, groundwater contamination, waste minimization, and environmental risk and health
	U2.10	Began enhancing the rigor of the manuscript review process
	U2.10	Placed manuscript acceptance decisions under the control of a Board of Editorial Review, to enhance the stature of the Journal in all water quality areas

occur when a title changes. Thus no comparison of findings can be made with previous studies. The limitations of the study are discussed below, including comments about potential bias and to what extent the findings can be generalized. Issues involved in using the findings to recognize new serial works are also discussed.

There was potential bias in the way the descriptions were grouped into subcategories, despite relying on common word usage in the grouping, since some descriptions could not be readily grouped based on word usage. By expanding the number of subcategories, the problem was lessened, with fewer descriptions requiring special handling. There was also potential bias in assigning levels to the subcategories. For example, the subcategory “Broadened geographic coverage” might have been classed as a medium-level change rather than a high-level change. Likewise, some subcategories assigned as medium-level subcategories could possibly have been classed as high-level subcategories, for example: “Narrowed content,” “Narrowed the article selection policy,” and “Increased emphasis on original, scientific, or conceptual articles.” The assignment of levels to the subcategories was preliminary and not a final determination of how the various subcategories should be treated.

The findings from the study can be generalized to academic serials, from which the sample was drawn. The findings should also have relevance to other types of serials, though the thirty-five subcategories identified in the study may not be as comprehensive as needed to categorize the full range of changes that might occur in a collection of both academic and nonacademic serials. A study of nonacademic serials is needed to determine whether additional subcategories would be needed for these serials.

Various approaches might have been taken in developing the procedures for recognizing new works. The three approaches chosen seemed logical in light of the data available and the need to be practical. The primary approach, requiring the occurrence of a high-level change in the serial, was the preferred approach. Whether one would also use alternate approaches would depend on how broadly or narrowly the concept of significant change is interpreted. With a narrow interpretation, only the primary approach would be appropriate. With a broader interpretation, the alternate

approaches might also be used. These decisions would have to be made by the serials community. The pros and cons of each approach are discussed below.

The primary approach required a high-level subject or function change to occur. Pros and cons of this approach include the following:

- Pros: This would be the most reliable approach for identifying new serial works, since only a major change would qualify a serial as a new work. It was also expected to be the easiest to apply, since one would look for only a few types of changes in the serial, falling within the four high-level subject or func-

Table 5. Successive Medium-Level Changes

Set No.	Sample No.	Subcategory Codes	Primary Level of Evidence
1	34	U1.2 U3.8	high
	33	U1.2	high
2	40	S1.3	high
	39	S2.4 S2.5 S2.6 U3.2 U3.3 U3.3 U3.6	medium
3	64	S2.6 S3.1	medium
	63	S2.6 S2.9	medium
4	71	S2.3 S2.6	medium
	70	S2.5	medium
5	97	U1.2	high
	96	S2.1 S3.1 U3.8	medium
6	114	S2.2	medium
	113	S2.2	medium
7	113	S2.2	medium
	112	S2.2 U2.4 U2.4 U2.7 U2.10 U2.10	medium
8	118	U1.2	high
	117	U1.2	high
9	117	U1.2	high
	116	S3.1 U3.7	low

Table 6. Approaches for Identifying New Serial Works

Approach	Changes Required by the Approach	New Works Identified (N = 120)*	Percent
Primary approach	One high-level change	35	29.2
Alternate approach (1a)	Three medium-level changes	6 (a)	5.0 (a)
Alternate approach (1b)	Two medium-level changes (prioritized)	3 (b)	2.5 (b)
Alternate approach (2)	Two medium-level changes (succeeding, prioritized)	1	0.8
Total		42 (a)	35.0 (a)
		39 (b)	32.5 (b)

* “N” represents the number of serials in the original sample from which the current sample was taken.

tion subcategories.

- Cons: The effectiveness of this approach would depend on how accurately the high-level subcategories have been identified.

The first alternate approach required multiple medium-level subject or function changes to occur. Some pros and cons of this approach would be the following:

- Pros: This approach would provide a way to potentially identify more new works than if just the primary approach were used.
- Cons: This approach may yield incorrect results, since a combination of moderate changes may not be sufficient to determine that a significant change has occurred. The limiting procedures may incorrectly determine that substantial change has occurred. The time required to look for the many kinds of medium-level changes in the serials and then apply the limiting procedures would also have to be considered.

The second alternate approach required successive medium-level subject or function changes to occur. Some pros and cons of this approach would be the following:

- Pros: This approach would provide a way to potentially identify more new works than if just the primary approach and the first alternate approach were used. A possible advantage of this approach over the previous alternate approach would be that more change may occur over a span of title changes than one might find in a single title change. In the one example found in the sample, there seemed to be a progression of change from one title change to the next.
- Cons: This approach may yield incorrect results, since the combination of changes may not be sufficient to be considered significant. The limiting procedures may, as above, incorrectly determine that substantial change has occurred. One would also have to consider whether a new work should be identified over a range of title changes, as well as the need to keep track of changes occurring over multiple title changes. Since only one potential new work was identified in the sample, this approach may not be worth considering, though in a larger sample more new works might have been recognized.

In summary, each of the three approaches for identifying new works has advantages and disadvantages. The primary approach, requiring high-level changes to occur, would be the most straightforward to apply and would yield the best results. The two alternate approaches, using medium-level changes, would require time to look for the various

kinds of changes in the serials and then to apply the limiting procedures. This may not be practical in a cataloging environment. One would also have to consider how strictly to interpret the concept of significant change in serials and whether the goal should be to limit the number of new works identified or to expand the number. These issues will require discussion by the serials community.

Recommendations

The purpose of the study was to develop a means for identifying significant subject and function changes in serials with title changes and then to recommend changes in cataloging rules for recognizing new serial works. A previous study recommended that a new work should be recognized only when a significant subject or function change has occurred. The current study enlarges upon this by providing a way to determine when a significant change has occurred.

Since the study showed that high-level subject and function changes provide the best evidence for significant change in serials with title changes, it is recommended that the four high-level subject and function changes identified in the study be used to recognize new works. Whether multiple medium-level changes should also be treated as significant was not conclusively determined in the study. It is recommended that the serials community evaluate the study's findings concerning both the high-level changes and the medium-level changes to determine whether broadening or narrowing of the assigned levels should be made and whether multiple medium-level changes should be considered as evidence for a significant change. Pending these discussions, a narrow interpretation of significant change is assumed in the recommendations that follow.

The recommendations that follow are specific to cataloging rules based on FRBR concepts, in particular the RDA rules, since the study used FRBR guidelines in the development of the procedures. The recommendations will have most relevance to academic serials, due to limitations in the sample, but the recommendations are broad enough to also have potential application to nonacademic serials. The recommendations are, moreover, specific to serials with title changes and do not cover serials with other types of changes, such as a change in responsibility.

Given the above limitations, it is recommended that the RDA rules for creating new access points for serials with title changes be modified to incorporate the changes described below. In particular, the following rules should be changed: RDA rule 6.1.3.2.2, titled "Major change in the title proper," along with RDA rule 2.3.2.13, titled "Major and minor changes in the title proper of serials."³⁰ The elements that should be incorporated include the following:

1. Determine the reason for the title change by using one of the following sources of information, in the following order:
 - An explanation provided in the first issue of the serial with the new title (or a subsequent issue, if needed)
 - An explanation provided by the publisher, editor, or sponsoring agency of the serial
 - An explanation from another external source explaining why the title changed
 - Words in the title
2. Create a new access point for a work when the reason for the title change meets one of the following conditions:
 - There has been a significant change in the subject content of the serial, as evidenced by a change in one of the following subcategories: (1) changed overall subject content, (2) broadened content to a more inclusive field(s) of study, or (3) broadened geographic coverage (see appendix B for examples).
 - There has been a significant change in the function of the serial, as evidenced by a change in the following subcategory: (1) changed overall function of serial (see appendix C for examples).

Conclusion and Further Research

The object of the study was to propose RDA cataloging rule changes for serials with title changes. Preliminary recommendations are made, pending additional research and testing. Some of the areas in which additional study is needed are described here.

The primary area in which additional research should be undertaken is with regard to title changes in nonacademic serials. It would be useful to collect information paralleling what was found for academic serials, including the identification of the subcategories of subject and function changes that occur in nonacademic serials with title changes. These findings could be used to broaden the recommendations in the current study to apply to both academic and nonacademic serials.

There is a further need to seek input from the serials community on the recommended rule changes, especially concerning the dividing point between a medium-level change and a high-level change. The community should also consider whether multiple medium-level changes would provide sufficient evidence for identifying a new work or if only high-level changes should be considered.

The proposed rule changes should be tested in a cataloging environment. Testing would help to determine whether the rule changes are practical for a working

environment and where clarification is needed. There is also a need to determine the practicality of seeking input from publishers, editors, and sponsoring agencies when the reason for a title change is not found in the serial itself. It would be helpful to know the time required to contact publishers and others, as well as the success rate in obtaining the needed information.

The recommendations made in the study provide a strong foundation for improving the RDA cataloging rules. The additional research and testing proposed here could be used to refine the recommendations further and ensure that the suggested changes will work well in today's cataloging environment.

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