COMPARISON OF ASSOCIATION BETWEEN LC SUBJECT HEADINGS AND CLASS NOTATIONS IN SINGLE- AND MULTIPLE-HEADING BIBLIOGRAPHIC RECORDS

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Subject headings and their corresponding class notations of 101,347 of the Library of Congress MARC records were analysed to determine variations in the association between Library of Congress Subject Headings (LCSHs) and Library of Congress Classification Notations (LCCNs) with respect to the variations in the number of subject headings per record. As the number of LCSHs per record increased, the association between LCSHs and LCCNs decreased. The probability of having identical LCCNs for identical LCSHs in single-heading records was found to be significantly higher than in multiple heading records. This implies that in recommending a class notation to a patron, distinction should be made between single- and multiple heading bibliographic records.
INTRODUCTION

Subject analysis of library materials involves the use of both classification and subject headings. These two approaches complement each other and are used for subject retrieval. Classification is unidimensional while subject heading approach is multidimensional. That is, while multiple subject headings can be assigned to a document to cover topics expressed in that work, there is usually only one class notation corresponding to those subject headings assigned to that document. Each approach of subject analysis permits the retrieval of information from a different angle. Considering the differences between these two methods of subject retrieval, this study attempts to determine the relationship between the number of subject headings per bibliographic record and the probability of having identical class notations for identical subject headings in the card catalog.

Various aspects of the relationship of subject headings and classification have been studied by a number of authors. Dewey studied the degree to which a subject catalog could satisfactorily be substituted for three classification systems and concluded that while some degree of substitution was possible, both subject heading and classification approaches were needed to give the best service to users.1 Irnmroth found a significant relationship between terminology of the LCSHs and
Library of Congress Classification (LCC) system. Patterson was concerned with determining the degree of relationship between the KSHs, LCC schedules, and index to the LCC schedules. He concluded that these three vocabularies are identical. Manheimer found that the LCSHs and LCC system in Class R are related in an entirely unpredictable way.

Fenske concluded that incataloging practice, approaching from subject heading to classification is better than from classification to subject heading. The results of Butler’s study suggested that practical increase in subject access to bibliographic collections can be obtained through the use of computer based cross-references between subject headings and class terms. The author studied various factors affecting relationships between subject headings and class notations.

**METHODOLOGY**

A comparison of identical subject headings in a list of bibliographic records sorted alphabetically by subject, i.e. a subject card catalog or an online subject catalog, would indicate that the classification notations corresponding to identical subject headings are not necessarily identical. Generally, the probability of having identical class notations for identical
subject headings in 'single-heading' bibliographic records is higher than in 'multiple-heading' records. In other words, fewer subject headings in bibliographic records will result in a greater agreement between class notations corresponding to various occurrences of a subject heading in a subject catalog. More subject headings in bibliographic records will cause a greater difference or disagreement between class notations corresponding to occurrences of a subject heading in a subject catalog. This implies that the degree of association between subject headings and their corresponding class notations decreases as the number of subject headings per bibliographic record increases. More subject headings assigned to a bibliographic record result in a significant decrease in the degree of association between subject headings and their corresponding class notations.

The derived hypothesis from the above statement suggests that there is significantly more agreement between the Library of Congress class notations corresponding to the Library of Congress Subject Headings in 'single-' than 'multiple-heading' bibliographic records. As the number of Library of Congress Subject Headings per bibliographic record increases, the degree of association between LCSHs and their corresponding LCCNs decreases.

Therefore, the question of this study is to find out effects of variation in number of subject headings per bibliographic
record on associations between the Library of Congress Subject Headings and the Library of Congress Classification Notations, that is, to determine if there is any statistically significant difference between LCSH/LCCN pairs among subject headings from bibliographic records with a different number of subject headings per bibliographic record.

To test the above hypothesis, subject headings and their corresponding class notations of 101,347 bibliographic records were selected from two LC MARC tapes through a systematic test. The subject headings (N= 131,263) were sorted alphabetically and subarranged by LC Classification notations. A computer program was developed to count all subject headings having an occurrence of more than one and then count the frequency of the most frequent identical class notation corresponding to these subject headings. Based on the number of subject headings per bibliographic record, all records were grouped into four categories. The probability of having identical class notations for identical subject headings in each category was calculated. In addition, correlation measures were computed for each group of bibliographic records and, using chi square test, the differences between each group were tested.
ANALYSIS OF DATA

The probability of having identical LCCHs for identical LCSHS decreased as the number of subject headings per bibliographic records increased, except for the fourth group. While the probability of having identical class notations for identical subject headings in single-heading bibliographic records was 82%, it reduced to 61% for the double-heading group, 54% for the triple-heading group, and 64% for the group of bibliographic records with four or more subject headings. The difference between observed and expected values in each group were statistically significant at the 0.001 level. The following table summarizes the results of data analysis.

Table 1

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<th>No. of LCSH/Record</th>
<th>LCSH</th>
<th>LCCN</th>
<th>p</th>
<th>r</th>
<th>s</th>
<th>Adjusted LCSH</th>
<th>Observed LCSH</th>
<th>Expected LCSN</th>
<th>Observed LCSN</th>
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<td>f</td>
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<td>5932</td>
<td>4727</td>
<td></td>
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<td>0.0085</td>
<td>0.113</td>
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</tr>
</tbody>
</table>

\[ x^2 = 463,946 \] \quad \text{df} = 3 \quad \text{p} < .001

df = Degrees of freedom.
f = Frequency counts.
p = Probability of having identical LCCNs for identical LCSHS.
r = Correlation between frequency counts of LCSHS and LCCNs.
s = Significance of correlation value r.
DISCUSSION

The probability of having identical LC class notations for identical subject headings decreased as the number of subject headings per record increased. The fact that there was not a 100% probability for the single-heading group showed that LCC notations were not consistently assigned to bibliographic records with the same LC Subject Headings. Alternatively, there could be more than one LC subject heading corresponding to each LCCN representing a given topic.

The reason that the fourth group had a higher probability than the previous group could be due to the fact that the frequency of subject headings in the last group was generally less than previous groups, therefore, the analysis of data was done with a relatively smaller number of subject headings. The low occurrence of identical subject headings in this group may have caused an unexpected increase in the probability.

Unlike probability measures, the pattern of variation in correlation measures between frequencies of class notations and subject headings was not fixed and predictable. Regression analysis between two sets of frequencies showed that when there is more than one subject headings per bibliographic record, the pattern of variation in LCCN frequencies with respect to variations in LCSH frequencies, would not be predictable.
CONCLUSION

An alphabetical subject list simulating a subject catalog was used to test effects of the variation in the number of subject headings per bibliographic record on the association between LCSHs and LCCNs. Although there was a statistically significant difference between the degree of association between LCSHs and their corresponding LCCNs, the variations in the number of the Library of Congress Subject Headings per bibliographic record was not a predictor of the variation of Library of Congress Classification Notations. Results indicated inconsistency in assigning the same class notations to the same subject headings. LC Classification index vocabulary and LC Subject Headings should be improved to increase association between the two methods of subject retrieval. When public service librarians recommend class notations from subject catalogs to patrons for possible browsing on a subject, their recommendation would be more precise if the suggested class notation is selected from single- rather than multiple-heading bibliographic records.
REFERENCES

1. Harry Dewey, "The Relationship Between the Headings in the Subject Catalog and the Classification Numbers of the Books," in Reclassification: Rationale and Problems; Proceedings of a Conference on Reclassification, held at the Center of Adult Education, University of Maryland, College Park, April 4 to 6, 1968. Edited by Jean M. Perreault. (College Park, Md.: School of Library and Information Services, University of Maryland, 19681, p. 57.


