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## Incomplete citations in undergraduate term papers from four campuses

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In scholarship, footnotes, endnotes, or bibliographies to accompany a scholarly paper and to credit the ideas' source are an accepted method of operation. In a section on note logic, the MLA Handbook for Writers of Research Papers, Theses, and Dissertations, advises humanities scholars: The conventions of documentation are a means to an end: to lend authority and credibility to your work and to enable the reader to locate sources with ease." (1) Style manuals for other disciplines include similar statements about the rationale for citations, and the Chicago Manual of Style outlines the necessary components of citations. (2) This paper addresses the question of whether undergraduates understand these basic components of citation.

Where do students learn the customs of bibliographic documentation? Although some high school teachers attempt to teach their students how to document term papers, many undergraduates enter college without knowing how to produce bibliographic citations. Academic librarians who teach bibliographic instruction or who work with students at the reference desk can testify that students are confused about documentation. In "Library Jargon: Student Comprehension of Technical Language Used by Librarians," Naismith and Stein suggest that students are even confused about the meaning of the word "citation." They ranked the term "citation" seventeen out of twenty in their table "Ranking of Terms from Most of Least Understood." (3)

Faculty members do not always seem to be aware of the confusion experienced by students as they try to work their way through the various style manuals for bibliographic citations. On the basis of an informal survey Freimer and Perry reported in 1986 that, while students saw documentation as a problem, faculty members did not. Faculty members "believed generally that students had merely to copy an appropriate citation style and be consistent in its usage. They considered this to be a relatively easy process." (4) The authors of this study go on to suggest that "a substantial reason for the difficulty students have in understanding the importance of careful documentation style" might be the faculty members themselves. "More than one faculty member was unaware of the wide variations in manuscript styles, or had out-of-date information about the styles which they required of their students." (5) Few of the faculty contributing papers to this study had written comments on the notes or bibliographies. Teaching faculty's lack of concern allows poor citation practices to continue.

When instruction about the construction of bibliographies and footnotes is provided to undergraduates, much of the emphasis is on the style of the citation. Beyond the question of whether or not students can master the finer points of particular citation styles is a more fundamental question: Do undergraduate students grasp the purpose of bibliographic citations sufficiently to include the basic elements in their citations?

### METHODOLOGY

This paper reports on a study of undergraduate student performance in the production of bibliographic citations. The investigators analyzed data from a larger study of undergraduate citation patterns. (6) Additional information about the construction of the sample appears in a report to the Council on Library Resources and is available from the investigators. Bibliographic citations attached to research projects or term papers were collected from two private liberal arts colleges and two large state universities from 1986-1989. The universities provided 59.3% of the 1,958 papers (46.2% from one; 13.1% from the other). One liberal arts college supplied 31.5% of the papers, and the remaining 9.2% came from the second liberal arts college. The distribution of the papers by academic department and level is shown in table 1.

In table 1, "Biology" also includes a few papers from agricultural sciences. "Business" includes economics, accounting, and general business. "Engineering" includes various kinds of engineering specialties. "English" includes freshman composition courses, as well as papers in literature and linguistics. The large number of religion papers would appear to be due to the inclusion of two church-related colleges in the study. However, one of those colleges contributed no papers in religion, but one of the state institutions

contributed 115 papers from comparative religion courses. Subjects in which all papers came from one campus included art history, education, engineering, mathematics, political science, and psychology. Two campuses contributed papers in philosophy and religion; three contributed to the total in biology, business, and sociology. Not surprisingly, all four campuses contributed papers in English and history.

As each paper was received from the cooperating instructor, the bibliography (or set of citations in any other form) was photocopied. Citations were coded for format, date, and certain other information. (Further information about this aspect of the study is available from the authors). Each citation was also coded as "complete" or "incomplete."

The requirements for a citation to be coded as "complete" were not very rigorous. The reference to a book was considered complete if it included an author (requirement ignored for composite works), title, publisher, and date. The citation to a journal article was expected to include author (where appropriate), title, name of journal, date, and page numbers. On other formats cited, coders were told to count the citation "complete" if, with the information provided, they thought they could probably locate or identify the item cited. The order of the bibliographic items in the citation and the punctuation of the citation were ignored.

For each paper in the sample, a percentage of "incomplete" citations was calculated (number of incomplete citations divided by the total number of citations in the paper) and recorded. All of the findings reported in the next section refer to the percentage of incomplete citations per paper.

## FINDINGS

According to the definition of "incomplete" described above, in 80% of the 1,958 papers, there were no incomplete bibliographic citations. (This includes the 84 papers that had no citations at all.) In 4% of the papers, there were no complete citations. In 10% of the papers at least one-third of the citations were incomplete, and in 5% of the papers at least two-thirds of the citations were incomplete.

To determine if the length of the bibliography (or the total number of citations included in the paper) was related to the completeness of the citations, papers were divided into two groups based on the length of the bibliography. Since 84 of the papers did not include even one citation, this analysis was limited to 1,874 papers. Table 2 gives the average number of incomplete citations by length of the bibliography. The differences between the two groups on the average percentage of incomplete citations per paper was significant ( $t = 5.025$ ;  $p < .001$ ). It appears that the more citations a student includes in a paper, the higher the rate of complete citations.

The question arises whether students do a better job of producing complete bibliographic citations if they limit themselves to only one format. Table 3 compares papers that contained both book and journal citations with those that had only book citations or only journal citations. The differences in average percentage of incomplete citations between papers with both book and journal citations and those with only book citations ( $t = 1.965$ ;  $p < .05$ ) or only journal citations ( $t = 3.615$ ;  $p < .001$ ) were significant. If students cite only books, they have lower rates of incomplete citations than if they cite only journals. Comparing the "journal-only" and "book-only" bibliographies produced significant differences for both the whole set of papers ( $t = 2.703$ ;  $p < .01$ ) and the subset of papers with five or more citations ( $t = 2.848$ ;  $p < .01$ ).

As students move through their academic programs, they may be assumed to become more competent in bibliographic documentation. From the papers in this sample, it appears that students in junior- and senior-level courses have a better grasp of the basic elements of a bibliographic citation than lower-division students. When analysis of variance was conducted on this variable and post hoc comparisons were done using the Newman-Keuls test, differences between the underclass and upperclass were significant. (7) When analysis of variance indicates there are significant differences among three or more groups on a particular variable, there are several multiple comparisons or post hoc comparisons that may be used to find out exactly where the significant differences occur. Some tests make it "easier" to find significant differences and others make it more difficult. The Newman-Keuls method tends to be in the middle of this liberal to conservative continuum and is recommended for routine purposes. (The probabilities produced from the Newman-Keuls test where  $p < .01$  [freshman students' average of incomplete citations greater than either junior or senior averages; sophomore average of incomplete citations is greater than either junior or senior averages].) There were no significant differences between freshmen and sophomores or between juniors and seniors.

There were also differences in the completeness of the bibliographies among the four campuses represented in the study. Analysis of variance produced significant differences ( $p < .01$ ) between the liberal arts colleges and the universities. There were no significant differences between the two universities or between the two liberal arts colleges.

When papers were analyzed individually for each campus in an effort to confirm differences in quality of bibliographic documentation by course level, only the two liberal arts colleges showed differences. "University B" did not contribute any papers from lower-division courses. Average percentages of incomplete citations per paper and percentages of papers with all incomplete citations are listed in Table 6 for the other university and the two liberal arts colleges. The difference in average percentage of incomplete citations between the upper- and lower-division papers in College A is significant at the .05 level ( $t = 2.103$ ) and in College B at the .01 level ( $t = 4.073$ ).

Among the academic department represented in this study by more than 100 papers, the most complete bibliographic citations were to be found in the sophomore-, junior- and senior-level English papers (2.30 average percentage of incomplete citations per paper) and in the philosophy (3.15 average) and history papers (3.92 average). The most incomplete citations were found in the religion papers (many of which were at the first year and sophomore level) and in the beginning English composition papers.

Because the papers in this study that were produced in upper-level courses had a significantly lower percentage of incomplete citations, they were pulled out for separate analysis by academic department. Analysis of variance confirms that some of the apparent differences between departments were significant ( $p < .01$ ). Political science papers had a higher average percentage of

incomplete citations than did papers from biology, business, English, engineering, history, psychology, sociology, or religion. English papers had more complete bibliographic citations than engineering papers ( $p < .05$ ). Other apparent differences were not significant.

When lower-division courses were analyzed separately (also using analysis of variance), fewer differences were apparent. Among the papers from the first two years, the business papers contained significantly more incomplete citations than did the history or political papers ( $p < .01$ ). There were no other differences.

## DISCUSSION

The generalization that emerges from the papers in this study is that students who cite more items in their papers or who cite a variety of items are more likely to include all the essential elements in their bibliographies. This may reflect the fact that instructors who demand longer bibliographies also emphasize correct citation style or it may indicate that students who are comfortable with the mechanics of bibliographic documentation simply include more citations with their papers.

The findings relating to differences among campuses and among course levels are interesting. The initial assumption that students at higher course levels are likely to be better at documenting their papers was only partially supported. In the only large university that supplied papers at every course level from freshman to senior, there were no differences among the various levels in regard to the average percentage of incomplete bibliographic citations. Only in the two liberal arts colleges were there clear differences between upper- and lower-division courses. In these two institutions, students in the junior and senior courses did appear to be more competent at documenting the sources for their papers. Does this reflect the high school preparation of the students who choose to attend a small liberal arts college (neither of the colleges in this study is located in an area of high population density) versus those who choose to attend a large university? Or, does it reflect the expectations of instructors in different types of institutions?

The differences in completeness of documentation noted among the various academic departments in this study are, in some cases, understandable. That upper-level English students should be able to provide complete citations is not surprising. Nor is it unexpected that students in philosophy and history are also fairly adept at including essential information in their bibliographic citations. What may be surprising is that students in freshman composition classes, where bibliographic citations would presumably be a part of the course syllabus, do rather poorly at including all the essential elements in their citations.

That political science papers should average the highest number of incomplete citations is puzzling. All of those papers came from one of the large universities, where the overall rate of incomplete citations was low. The bibliographies of the political science papers did not include an unusual proportion of different formats. Thirty-eight percent of the citations were to books; 50% to journal articles; 6% to newspapers; and 6% to various other formats. (For all papers in this study, the percentage of citations to materials other than books and journal articles was 12%.) When the political science papers were analyzed by course level, the junior-level papers were found to have more incomplete citations than either the sophomore or senior papers ( $p < .05$  by analysis of variance). Perhaps this reflects the particular emphasis placed (or not placed) on the bibliographic aspect of the assignment by one instructor.

The exploratory study reported in this paper raised a number of questions about the occurrence of incomplete bibliographic citations in the papers of undergraduates. Why do papers produced at some institutions and in some academic departments include essential elements when others do not? Do students who understand how to format bibliographic citations also see the need for including more documentation with their papers? A question that pervades all this speculation concerns the influence of instructors. Is the quality of documentation in a set of student papers directly related to the emphasis the instructor places on this aspect of the assignment? Freimer and Perry suggested in their study that citation training should be included in bibliographic instruction. (8) It would be interesting to study the effects on student documentation habits of such a library-sponsored program, particularly in situations where faculty expectations and efforts in this area of instruction are low.

Because the scholarly world values citations, the practices of undergraduates must change as they become graduate students. The few who eventually become practicing scholars must learn to cite completely, accurately, and in the style approved by the discipline or specific journal. The widespread requirement of a methodology course in each graduate discipline suggests that such a course may foster a transition from the careless practices of undergraduate years to the more rigorous ones of scholarly publication. Bibliographic instruction librarians sometimes have opportunities to offer similar, but less intensive, instruction to undergraduates. Librarians should be more aggressive in arranging such sessions, in measuring their effectiveness, and in improving methodologies accordingly. Few teaching faculty commented on the students' bibliographies. They should be more aggressive in emphasizing citation rationale and in measuring student performance in the creation of bibliographies. These stronger approaches could improve undergraduate performance in the construction of citations.

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(8) Feiner and Perry, p.354.

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