

Citation Behavior of Undergraduate Students: A Study of History, Political Science and Sociology Papers

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ABSTRACT

The goal of this analysis was to obtain local citation behavior data on undergraduates researching history, political science and sociology papers. Even with the availability of Web sources, students cited books and journals; however, usage varied by subject. References to specific Web sites domains also varied across subject area. Most of the top journal titles that students referenced were online and locally owned. Students cited a broader range of journal titles than predicted by the Law of Scattering and cited titles across a wide array of subject areas. This data helped identified potential gaps in the library's collection and services.

INTRODUCTION

This study was undertaken because library faculty at the State University of New York, College at Oneonta (SUNY Oneonta) did not possess data regarding the citation behavior of this institution's undergraduate students. The College at Oneonta is a comprehensive college of liberal arts and sciences located in central New York State. SUNY Oneonta has a student body of over 5,900 students and approximately 5,800 undergraduates. Librarians at SUNY Oneonta wanted to pinpoint the specific types of resources students were citing in their bibliographies and use this information to improve library collections and services. During discussions related to collection development and library instruction, librarians raised many questions regarding the information sources students cite in their research papers. Examples of questions broached included: Are students using World Wide Web sites more than traditional library sources (defined as books and scholarly journals) for their research? What kinds of Web sites are students citing? What journals do undergraduates cite most frequently in their research papers? Do students writing a history research paper use different types of resources than students writing a paper for a political science class? SUNY Oneonta librarians were able to answer these questions about the institution's students with anecdotal evidence only. Librarians at other colleges and universities have answered similar questions by completing citation analyses of student papers. This entails counting the number of times sources are cited in a bibliography (Mortimer 2007). Previous citation studies at other colleges have provided excellent local information with respect to how students use a variety of information sources; however, these findings cannot necessarily be generalized to other academic institutions and therefore have limited applicability beyond the college or university at which the study was completed.

Therefore, an analysis of selected SUNY Oneonta undergraduates' research papers was undertaken.

The goal of this analysis was to obtain local citation behavior data in order to answer the questions the college's librarians were raising with respect to student citation patterns. This investigation revealed some noteworthy citation behavior. For instance, students heavily cited books in the history papers and referenced a more extensive range of journal titles than suggested by the Law of Scattering. Another aim of this study was to ascertain if this data could help to guide decision making with respect to library services and collections in three main areas. Specifically, the data could help to determine a core list of undergraduate journals, assist with purchasing and deselection decisions, and ascertain if library instruction needs to be marketed more to faculty. Additionally, as there seems to be no recent citation analyses focusing solely on undergraduate political science or sociology bibliographies, this study could be used as a baseline for further examination of these two subject areas. When the results of this study were compared to other undergraduate citation analyses, there were some similar patterns in the citation behavior of students at SUNY Oneonta and other colleges. Librarians at other academic institutions with a profile similar to SUNY Oneonta may find these patterns useful when reviewing their own collections and instruction programs.

LITERATURE REVIEW

Citation studies of undergraduate research papers provide a wealth of data regarding student use of information resources. Citation studies can determine the type of resources (for example, books, journal articles, Web sites) that undergraduates cite in their bibliographies. In a 1990 study of 1,775 undergraduate papers and projects in the humanities, social sciences, and

sciences from four academic institutions, undergraduates overwhelmingly cited books and journals in their bibliographies (Magrill and St. Clair 1990). Furthermore, the use of books versus journals was different among the three disciplines. In their subsequent investigation using the same set of undergraduate papers and projects, St. Clair and Magrill determined the percentage of students' citation to monographs, journals, and other resources in thirteen academic subjects (1992). This study also showed that the percentage of citations to books, journals and other information sources varied by subject area. These extensive analyses provide valuable insight into undergraduates' use of books and journals but have their limitations. For example, the results are likely limited to the particular academic institutions in the studies. Furthermore, these studies were completed before extensive use of the Internet for library research and do not address undergraduates' use of World Wide Web sources.

Citation studies of undergraduate papers and projects in the humanities, social sciences and sciences completed more recently did examine the citation of Web sites. Several of these studies showed that even in the age of the World Wide Web, books and journals continued to be the dominant sources cited in student papers, but students were definitely referencing Web sites in their bibliographies (Jenkins 2002; Krause 2002; Leiding 2005; Carlson 2006; Mill 2008; Gadd, Baldwin and Norris 2010; Cooke and Rosenthal 2011). Some factors attributed to increased citation of scholarly resources included higher class level, instruction, and faculty guidelines regarding use of suitable resources for research (Davis 2003; Carlson 2006; Cooke and Rosenthal 2011). Mill's and Cooke and Rosenthal's studies are particularly useful as they probed beyond the number of Web resources the students cited and examined the kinds of sites they were referencing (for example, .com, .gov, .edu., org). Finally, the Mill, Leiding, and

Carlson findings were similar to St. Clair and Magrill's conclusion that the dominant type of resource cited in undergraduate papers varied by academic discipline and subject.

Other citation studies have shown a decline in book and journal citations in undergraduate papers. For example, Davis and Cohen (2001), Davis (2002), and Kriebel and Lapham (2008) examined bibliographies in undergraduate papers over several years. These studies showed a consistent decrease in the citation of scholarly resources; however, Davis (2003) discovered that student citations to books and journals increased, and Web site citations decreased, "as the professor provided guidelines on appropriate research sources" (45). These studies also examined the domains of the Web sites the students cited. Davis (2003) noted that the majority of the domains students cited were .com sites. In contrast, in the Kriebel and Lapham study, students primarily cited non-commercial Web sites in their papers, but the use of .com sites grew over the course of their study.

Citation studies have also been used to determine core periodicals titles and if the Law of Scattering is applicable. The Law of Scattering suggests that "80 percent of the citations [arise] from 20 percent of the journals" (Tobias 1975, 15). For example, a study of senior theses of psychology undergraduates at Indiana and DePauw indicated that students cited a relatively small number of journal titles; therefore, the Law of Scattering applied at these institutions (Hardesty and Ottmanns 1989). As a result, the researchers concluded that a few titles would likely meet the needs of these students. In contrast, a citation analysis of undergraduate and graduate psychology research papers conducted at St. Mary's University revealed that the Law of Scattering did not apply at this particular institution, and citation analysis was deemed as a limited tool for journal selection decisions (Sylvia 1998). Other undergraduate citation studies have been used to ascertain the most frequently cited periodicals in introductory composition 100

papers, social sciences and humanities honors theses, and biology students' research papers (Joswick and Stierman 1997; Kraus 2002; Leiding 2005). None of these studies investigated the extent to which the students used journals outside of the subject of the class their papers were for; however, a study of engineering master's theses examined the interdisciplinary use of journals (Williams and Fletcher 2006). This study showed that while the graduate engineering students primarily used journals in the Library of Congress classes of technology and science, they also cited journals in other LC classes including medicine and social sciences. As a result of these findings, the authors noted that it is important to take into account the value of non-engineering journals to graduate engineering students. It would be useful to determine the extent to which undergraduate students at SUNY Oneonta use journals outside of their respective subject area in order to help subject bibliographers make more informed collection development decisions.

METHODOLOGY

In order to analyze the resources undergraduate students at SUNY Oneonta use to complete their research papers, it was decided to collect the papers of students in two academic departments in the college's division of science and social science (history and political science) and one in the division of behavioral and applied science (sociology). The departments of history, political science, and sociology were chosen since the author is the subject bibliographer for the sociology and political science departments and an instructor for library instruction classes for all three departments. The study attempts to answer the following questions:

1. What is the percentage of student citations to books, scholarly/academic journals articles, newspaper articles, magazine articles, other periodical articles, and Web sites in history, political science and sociology papers?
2. What is the percentage of student citations to specific Web site domains?
3. What are the most cited scholarly/academic journal titles for each academic subject?
4. What is the prevalence of interdisciplinary journal usage?

Seven professors in the identified departments, who were known to the author, were asked if their students' bibliographies could be collected for the study. The bibliographies were collected in this manner as it was deemed to be the most straightforward method. Students who agreed to participate in the study signed consent forms giving the author permission to collect their anonymous bibliographies. Copies of student bibliographies were collected in four semesters (spring 2006, fall 2006, spring 2007, and spring 2008). A total of 378 research papers were collected from twenty-three classes. These included twelve history classes, five political science classes, and six sociology classes. The classes were comprised of five 100-level classes which usually consist predominantly of freshmen, twelve 200-level classes which consist of sophomores and juniors, and six 300-level classes which are almost exclusively made up of seniors. The history classes included five 100-level classes and seven 200-level classes. The political science classes included three 200-level classes and two 300-level classes. The sociology classes included two 200-level classes and four 300-level classes. Of the 378 research papers, 248 were history papers, seventy-nine were political science papers and fifty-two were sociology papers. There were a total of 1,874 citations in the history papers, 689 citations in the political science papers and 451 citations in the sociology papers.

The citations in each of the bibliographies were organized into several categories and then counted in order to determine the percentage of student citations to specific resources. The categories were books, scholarly/academic journal articles, magazines articles, newspaper articles, other periodical articles, Web sites, and other sources. Book resources included complete books, book chapters, reference books, and electronic books. Scholarly/academic journals articles included articles in periodicals that Ulrichsweb.com categorized as scholarly/academic journals. Magazine articles and newspaper articles included articles in periodicals that Ulrichsweb.com categorized as magazines and newspapers respectively. The category “other periodical articles” was defined as articles in periodicals that Ulrichsweb.com classified as a bulletin, monographic series, or newsletter. All periodical articles were considered an article if they were in print or electronic format from a subscription database. Web sites were defined as a source cited as an URL but excluded documents from a library subscription database. The category “other sources” included print government documents, print non-governmental organization documents, court cases, class notes, class hand-outs, interviews, and news reports from news gathering organizations such as the Associated Press that were retrieved from the library’s subscription databases. There were a number of incomplete or inaccurate book and journal citations in the bibliographies. In these instances, an attempt was made to identify and verify the source using a variety of tools including the library’s online catalog, WorldCat, Central Search (a federated search engine), and other subscription databases held at the library including LexisNexis, Academic Search Complete, SOCIndex, and JSTOR, and the Internet. Resources that could not be verified were classified in the category “unidentified sources.” In order to determine the percentage of students’ citations to specific Web domains, Web sites were classified by their domain (for example, .edu, .com) and counted.

In order to determine the most cited scholarly/academic journal titles for each subject (defined as those titles cited three or more times), the occurrence of each journal title cited in the student papers was tallied. Journal titles that had changed were collapsed under their most current title and counted as one title only. Calculations were also made to determine if the Law of Scattering applied in this study.

Interdisciplinary journal usage was determined by first calculating the total number of unique scholarly/academic journal titles cited and then categorizing each unique scholarly/academic journal title by the subject or subjects assigned to it in Ulrichsweb.com. Each journal title from the history papers that was assigned only the classification “history” was counted and coded as “classed only as history.” Each journal title from the history papers that was assigned the classification “history” and one or more other subjects was counted and coded as “classed as history and other subject(s).” Each journal title not classified as “history” or “history and other subject(s)” was counted and coded as “other subject(s).” The same process was repeated for the scholarly/academic journal titles cited in the political science and sociology papers.

RESULTS AND DISCUSSION

Student Citations to Specific Resources

Even with the availability of Web sources, SUNY Oneonta undergraduates still cited traditional library sources, but their citation patterns varied by subject area (Table 1). For instance, the history papers contained the most citations to traditional library sources and the most citations to books in comparison to the political science and sociology papers. Of the 1,874 citations in the history papers’ bibliographies, 86 percent were to traditional library resources.

More specifically, 67 percent of the citations were to books. Scholarly/academic journal articles were the second most commonly cited resource in the history papers at 19 percent. Only 8 percent of the citations were to Web sites. Citations to newspaper, magazine and other periodical articles, other sources, and unidentified sources were minimal and comprised only 6 percent of the total citations.

The citation pattern in the history papers is generally similar to other studies in the literature review. For example, in Carlson's (2006) analysis of pooled humanities papers, which included thirty-nine history papers, 79 percent of the citations were to books (70 percent) and journal articles (9 percent). Cooke and Rosenthal's (2011) study of advanced level history papers noted that 72 percent of the citations were to books and 13 percent were to journal articles for a total of 85 percent of the citations to traditional sources. The students in both of these studies referenced more Web sites (14 percent in both cases) than the SUNY Oneonta students. Furthermore, St. Clair and Magrill's (1992) study of papers completed in the late 1980s observed that 93 percent of citations in the history papers were to books and journals which is only 7 percent more than the results in this study. Even more striking is that the SUNY Oneonta students cited slightly more books (67 percent) than the students in the St. Clair and Magrill study (66 percent). This citation pattern indicated in the present study implies that at SUNY Oneonta, undergraduate historical research is greatly dependent on books. For collection development purposes, a case may be made to be conservative when withdrawing history books from the local collection. The results of the analysis of the history papers may also suggest the importance of maintaining funding for book purchases for history. These findings may also indicate that history faculty are providing clear instructions to students regarding the use of

acceptable resources for research, a factor which Davis (2003) noted resulted in an increase in the use of scholarly resources.

In contrast to the history bibliographies, only 42 percent of the citations in the political science bibliographies were to traditional library sources. Web sites were the most frequently cited resource in these bibliographies. Of the 689 citations in the political science papers, 42 percent were to Web sites, 23 percent were to scholarly/academic journal articles, and 19 percent were to books. In addition, citations to newspaper, magazine articles, and other periodical articles made up 8 percent of the total citations. The “other sources” comprised 6 percent of the cited sources. In total, non-traditional sources combined (Web sites, magazine and newspaper articles, and other sources) comprised 56 percent of all the citations. In comparison to other studies that examined combined social sciences papers, citations of traditional sources were much lower and references to Web sites were particularly greater in the SUNY Oneonta study (Leiding 2005; Carlson 2006; Mill 2008). In these other studies, the percentage of citations to traditional sources ranged from 71 percent to 76 percent. Book and journal use ranged from 25 percent to 43 percent and 28 percent to 48 percent respectively. The percentage of citations to Web sites extended from 7 percent to 14 percent. The low use of traditional sources in this study is comparable to the findings of Davis and Cohen (2001). For example, they observed that in a sample of microeconomics papers, 39 percent of citations were to traditional sources (19 percent to books and 20 percent to journal articles). Additionally, 58 percent of the citations were to non-scholarly sources including 21 percent to Web sites which is one-half of the citations in the SUNY Oneonta study.

The relatively low use of traditional sources and very high use of Web sites in the political science students’ papers may be as result of a number of factors. For example, this

citation pattern could be attributed to an absence of explicit faculty guidelines regarding the use of traditional resources for academic research. A review of faculty directives to the students in the study regarding the use of suitable sources would have to be completed in order to determine if this were the case. Another possibility could be that these particular students did not know how to locate books and scholarly articles for political science research. The library may need to market instruction and research consultation services to political science faculty and students so that they are aware that assistance in finding scholarly material is available. Finally, the low use of books could be due to a lack of relevant political science books in the library collection. Librarians may need to review the library's book collection to ensure that there are ample, useful resources available for the political science curriculum.

In comparison to the political science papers, the sociology papers contained more citations to traditional scholarly sources, but fewer than the history papers. Additionally, the sociology papers consisted of more citations to scholarly/academic journal articles than the history and political science papers. Of the 451 citations in the sociology papers, 53 percent were to traditional sources and 47 percent were to non-traditional sources. Of all the citations, 38 percent were to scholarly/academic articles, 19 percent were to Web sites and 15 percent were to books. Sociology papers also contained more newspaper and magazine citations (18 percent) than either the history or political science essays. In comparison to the other studies in the literature review that analyzed social sciences papers, the use of traditional sources was generally higher than in the SUNY Oneonta study (Jenkins 2002; Leiding 2005; Carlson 2006; Mill 2008). In the literature, the percentage of citations to journal articles ranged from 20 percent to 48 percent. The proportion of citations to journal articles in the SUNY Oneonta sample was in the middle of this range. The same was true of the Web resources in the SUNY Oneonta study. The

percentage of citations to Web sites spanned from 7 percent to 44 percent in the literature. In comparison, book citations were higher in the literature, ranging from 25 to 43 percent, than in the current study. This low use of books may indicate a weakness in the library's book collection. Book resources for sociology may need to be reviewed in terms of their usefulness.

TABLE 1
Percentage of Citations by Resource

Resource Cited	History		Political Science		Sociology	
	Total	%	Total	%	Total	%
Books	1,256	67	131	19	66	15
Scholarly/Academic Journal Articles	361	19	158	23	171	38
Web Sites	157	8	287	42	88	19
Newspaper Articles	29	2	25	4	40	9
Magazine Articles	51	3	29	4	42	9
Other Periodical Articles	10	1	2	.29	14	3
Other Sources	8	.43	42	6	21	5
Unidentified Sources	2	.11	15	2	9	2
Total Number of Resources	1,874		689		451	

Percentages may not add up to 100 due to rounding

TABLE 2
Percentage of Web Site Citations by Domain

Resource	History % n=157	Political Science % n=287	Sociology % n=88
.gov	0	22	48
.edu	35	6	9
.org	21	32	20
.com	24	20	16
.net	3	4	1
other	17	16	6

TABLE 3 Most Cited Scholarly/Academic Journals: History	
Journal Title	Citations
<i>English Historical Review</i>	18
<i>American Historical Review</i>	13
<i>History Today</i>	12
<i>Historical Journal</i>	11
<i>Greece and Rome</i>	9
<i>Journal of Interdisciplinary History</i>	8
<i>Speculum</i>	7
<i>Journal of Contemporary History</i>	7
<i>Past & Present</i>	7
<i>Journal of Religion</i>	7
<i>Classical Quarterly</i>	6
<i>Economic History Review</i>	6
<i>Classical Review</i>	6
<i>Church History</i>	5
<i>Journal of British Studies</i>	5
<i>Sixteenth Century Journal</i>	5
<i>African Affairs</i>	4
<i>Archaeology</i>	4
<i>Comparative Studies in Society and History</i>	4
<i>Journal of Hellenic Studies</i>	4
<i>Journal of Social History</i>	4
<i>Journal of the History of Ideas</i>	4
<i>Journal of Women's History</i>	4
<i>Royal Society of Tropical Medicine and Hygiene Transactions</i>	4
<i>American Sociological Review</i>	3
<i>Human Ecology Review</i>	3
<i>International Affairs</i>	3
<i>Journal of Military History</i>	3
<i>Journal of Roman Studies</i>	3
<i>Journal of the American Oriental Society</i>	3
<i>Nature</i>	3
<i>Renaissance Quarterly</i>	3
<i>Signs</i>	3
<i>American Philological Association. Transactions</i>	3
<i>Victorian Studies</i>	3

Journal Title	Citations
<i>Asian Survey</i>	8
<i>Western Political Quarterly</i>	7
<i>African Affairs</i>	7
<i>Journal of Modern African Studies</i>	6
<i>Political Research Quarterly</i>	4
<i>African Studies Review</i>	4
<i>American Political Science Review</i>	3
<i>Journal of American College Health</i>	3
<i>Journal of Black Studies</i>	3
<i>Journal of Negro History</i>	3
<i>Social Forces</i>	3
<i>South Atlantic Quarterly</i>	3
<i>Phylon</i>	3

Journal Title	Citations
<i>Journal of Higher Education</i>	10
<i>Pediatrics</i>	8
<i>Journal of Marriage and Family</i>	6
<i>College Student Journal</i>	6
<i>American Journal of Public Health</i>	6
<i>Topics in Clinical Nutrition</i>	4
<i>Social Service Review</i>	4
<i>Social Forces</i>	4
<i>Family Relations</i>	4
<i>Journal of Aging Studies</i>	3
<i>Journal of Economic Perspectives</i>	3
<i>Journal of Elder Abuse and Neglect</i>	3
<i>Journal of School Health</i>	3

TABLE 6 Subject Class of Top Scholarly/Academic Journals Cited	
History n=35	
History only	28%
History and other subject(s)	19%
Other subject(s)	53%
Political Science n=13	
Political Science only	33%
Political Science and other subject(s)	19%
Other subject(s)	58%
Sociology n=13	
Sociology only	8%
Sociology and other subject(s)	15%
Other subject(s)	77%

TABLE 7 Subject Class of All Scholarly/Academic Journals	
History n=160	
History only	18%
History and other subject(s)	16%
Other subject(s)	66%
Political Science n=96	
Political Science only	16%
Political Science and other subject(s)	12%
Other subject(s)	72%
Sociology n=104	
Sociology only	11%
Sociology and other subject(s)	12%
Other subject(s)	77%

Student Citations to Specific Web Sites' Domains

The analysis of the Web sites' domains also indicated that the citation pattern of domain types cited varied across academic subject (Table 2). SUNY Oneonta history students showed a preference for .edu sites. Of the 157 Web sites cited in the history papers, the largest proportion, 35 percent, were to .edu sites. These types of Web sites may have contained primary source materials which would be appropriate for a history paper. The most referenced domain in the political science papers, 32 percent, was .org. Think tanks and public policy centers' Web sites typically use the .org domain. These are Web sites that contain information such as research reports on public policy and government issues and are appropriate for political science research. There is a possibility that the students were citing these sorts of Web sites; however, this is only speculation as the sites in the study were not inspected. In addition, 22 percent of the Web site citations were to .gov sites. Information on government sites is suitable for political science research. Like the political science papers, the majority of Web sites cited in the sociology papers had .org and .gov domains. Specifically, of the eighty-eight Web sites referenced in the sociology papers, 48 percent were to .gov sites and 20 percent were to .org sites. The vast majority of these citations, 76 percent, were in papers for a social policy course. Like the political science papers, the information located on the .org and .gov sites may be suitable for researching a social policy topic. The .com sites were a feature of the citations as well. They were the second most cited domain in the history and political science papers and the third most referenced domain in the sociology papers. With the exception of Cooke and Rosenthal's (2011) research, there is no other study of domain use across academic subject area in the literature review. Their study also showed a variance in citation pattern of domain types among different academic subjects.

Top Cited Academic/Scholarly Journal Titles

Tables 3, 4 and 5 show the most cited scholarly/academic journals for each of the three academic subjects in the study. During the period of the study, SUNY Oneonta's library had full-text, online subscriptions to all of these titles with the exception of the *Journal of Elder Abuse and Neglect* which the library did not own in either electronic or print format. The journal titles that the library subscribed to were available in one or more of the following general databases: JSTOR, Academic Search Premier, Expanded Academic and Project Muse. Similarly, Krause (2002) noted that his institution had a subscription to most of the journals on his top cited journal list and most were electronically accessible. Joswick and Stierman (1997) and Leiding (2005) also noted that many of the journals on their top cited journal lists were owned by their institutions. The full-text availability of all but one of these titles in the SUNY Oneonta study may be an indication that the students were repeatedly citing these journals because they were conveniently accessible. There is also some evidence that students were using these particular journals because they were relevant to the subject matter of their courses. For example, the top cited journal in the history papers was *The English Historical Review (EHR)*. According to the journal's Web site, *EHR*'s scope includes British history and "almost all aspects of European and world history since the classical era" (Oxford University Press 2011). Three British history and five western civilization classes were in the study. Students in these classes were the ones who cited *English Historical Review* in their papers. Similarly, a number of the top journals cited in political science included coverage of Africa. One of the classes included in the study was about African politics. The most cited scholarly/academic journal titles in the study could represent the foundation of a core list of titles for the history, political science and sociology classes represented in this study. A study that includes a greater variety of

classes would produce a more comprehensive list. As long as these classes in the study continue to be offered at the college, the library may want to consider maintaining its subscription to databases which contain the titles on the most cited lists.

Additionally, the Law of Scattering, which suggests that the top 20 percent of journal titles cited will produce 80 percent of the citations, did not apply. For instance, the top 20 percent of scholarly/academic journals cited in the history papers generated 51 percent of the citations. The top 20 percent of scholarly/academic journals cited in the political science papers produced 44 percent of the citations. Finally, the top 20 percent of journal titles cited in the sociology papers generated 44 percent of the citations. This occurrence may have been a consequence of using an electronic database rather than students deliberately seeking articles in a wide range of journals. For example, students at SUNY Oneonta are able to connect to articles easily from one database to another by article linking software. Article linking software can provide access to articles in several different databases and thus a broad assortment of journal titles.

Interdisciplinary Usage

In addition to having used a wide range of journal titles, the results of this study suggest that students relied on a broad variety of journals across academic subjects (Table 6). For example, of the top cited journals titles referenced in the history papers, 28 percent were classed as “history only” and 19 percent were classified as “history and other subject(s).” Over half of the journals (53 percent) were categorized as “other subject(s).” Of the top cited journal titles in the political science papers four of the twelve, or 33 percent, were classified as political science, one was classified as political science and business and economics, and the remaining seven, or 58 percent, were categorized as “other subject(s).” Of the thirteen top cited journal titles in the

sociology papers, only one was categorized as “sociology only,” and two were classified as “sociology and other subject(s).” The remaining 77 percent of these journals were categorized as “other subject(s).”

The results were similar when all the cited titles were analyzed (Table 7). For instance, of the 160 unique journal titles cited in the history papers, 18 percent of these were classed according to Ulrichsweb.com as “history only” and 16 percent were classed as “history and other subject(s).” A majority of the titles, 66 percent, were classed as “other subject(s).” The top other subject classes of the journals the history students used were political science (14 percent), religions and theology (8 percent), classical studies (5 percent), business and economics (5 percent), and anthropology (5 percent). The results for the political science papers were similar to the history papers. Of the ninety-six journal titles cited in the political science papers, 16 percent were classed solely as political science and 12 percent were classed as “political science and other subject(s).” A notable portion of the journals, 72 percent, were categorized as “other subject(s).” In addition to political science journals, students writing political science papers referenced journal titles that were classified as sociology (9 percent), business and economics (8 percent), history (7 percent), law (6 percent), and social sciences, comprehensive (5 percent). Even fewer of the journal titles cited in the sociology papers were classified only as sociology. Of the 104 journal titles cited, only 11 percent were classed solely as sociology and 12 percent were classed as “sociology and other subject(s).” The remaining 77 percent of the titles were classed as “other subject(s).” The largest portion of journals cited in the sociology papers were classed as education (17 percent). Other subject classes of journal titles cited in the sociology papers included medical sciences (10 percent), business and economics (8 percent) and gerontology and geriatrics (8 percent).

Students in each of the three academic subjects cited scholarly/academic journal titles classified across a broad spectrum of subject areas. The use of journal titles across a wide range of subject areas could have been due to the students' assignments which required them to conduct interdisciplinary research. On the other hand, this occurrence simply could have been due to serendipity. General databases cover a broad array of academic fields of study thus providing students with access to articles published across a variety of subject areas. Additionally, article linking software can easily lead a student researching a history paper to articles in business or political science databases.

CONCLUSION

This study of select SUNY Oneonta undergraduates revealed very constructive information regarding their citation behavior. The results of this analysis demonstrated that even with the availability of other types of sources, particularly Web sources, the students still cited traditional library sources to complete their research papers; however, the use of traditional library sources varied by subject. Of the three subject areas, the history papers contained the most citations to traditional library sources and the students showed a strong preference for referencing books. Web sites were not a major component of these bibliographies. In contrast, the political science papers had the fewest citations to traditional library sources and Web sites were the leading resource cited in these papers. The sociology papers contained the most citations to scholarly/academic journals which were the top source cited in these papers. The sociology papers also had the fewest references to books. The analysis of the Web sites' domains also indicated a variance across the three subject areas. History students showed a preference for .edu sites. The primary domain referenced in the political science and sociology

papers were .org and .gov respectively. The top cited journal titles, with the exception of one, were available in a full-text, general database to which the library had a subscription. Students cited a broader range of titles than the Law of Scattering predicted. They also cited titles across a wide array of subject areas.

This study has a number of limitations. For instance, the sample used was not a random sample so the results cannot be generalized to other SUNY Oneonta students or other colleges. There may also have been a bias in the data as the faculty members who participated in the study were possibly willing to do so because they felt confident that their students were citing appropriate resources in their papers. Furthermore, the bibliographies may not have accurately reflected how the students used the resources they cited. Students may have cited sources in their bibliography from which they took no information and they may not have cited every source from which they acquired information. Finally, the study did not consider a number of factors, such as faculty guidelines, library instruction, and class level, which may have influenced the types of sources the students referenced. Nonetheless, this study has provided useful, preliminary information concerning students' citation patterns and identified some potential gaps in the library's collection and services.

There are other aspects of student citation behavior that are worth investigating in order to gain a greater understanding of how students use resources for their research. For example, are the students citing resources that are relevant to their assignment? It would also be useful to determine why students cite the resources they do. For instance, do faculty guidelines influence students' choice of information sources? Additionally, does library instruction shape students' selection of sources to cite in their papers? Furthermore, since Web citations are a reality in students' bibliographies, it would also be valuable to go beyond merely identifying the Web site

domains and ascertain the specific Web resources being cited (for example, government documents, think tank reports, Wikipedia entries, historical documents). Moreover, as the papers in this study were collected a few years ago, it would be useful to examine bibliographies collected more recently and compare them with the results of this study. Finally, what are the citation patterns of students writing research papers in subjects other than the ones in this study? Further study would provide Oneonta librarians with more insight into the nature of the students' citation habits and could help to enhance library services and collections.

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