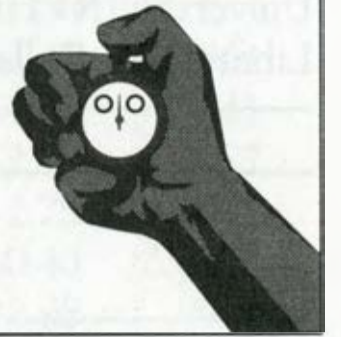


# RESEARCH FORUM



*Bonnie Gratch, editor*



## Undergraduate term paper citations

**By Gloriana St. Clair**

*Assistant Director for Technical, Automation, and Administrative Services  
Oregon State University*

**and Rose Mary Magrill**

*Library Director  
East Texas Baptist University*

Under the aegis of the Council for Library Resources and the research program of Texas A&M University Libraries, the authors collected 1,775 undergraduate term paper bibliographies dating from the spring of 1986 through the fall of 1988. The purpose of the study was to improve basic, philosophical understanding of undergraduate use of library materials in order to provide librarian practitioners with an enhanced knowledge base for making decisions in collection management, materials storage, bibliographic instruction, collection use, and resource allocation. The background for the study, literature review, methodology, and findings on format and age of materials cited are available from the authors. Results dealing with citation patterns by discipline and course level are scheduled to appear in the Spring 1990 issue of *Collection Management*.

The original plan for the project anticipated collecting all the papers from one campus. However, as the study progressed, papers were collected from two similar pairs of institutions:

**East Texas Baptist University** (152 papers). Baptist liberal arts college in Marshall, Texas. Enrollment approximately 725. University Library holds 105,202 volumes.

**Westmar College** (462 papers). Methodist liberal arts college in LeMars, Iowa. Enrollment approximately 600. Charles A. Mock Library holds 92,478 volumes.

**Oregon State University** (257 papers). Science and technology-oriented research university in Corvallis, Oregon. Enrollment approximately 16,000. William Jasper Kerr Library holds 1,075,907 volumes.

**Texas A&M University** (904 papers). Science and technology-oriented research university in College Station, Texas. Enrollment approximately 40,000. Sterling C. Evans Library holds 1,584,735 volumes.

With this information at hand some comparisons between the two types of institutions became possible.

### **Citation patterns by type of institution**

The original plan for this project did not anticipate that papers would be collected at more than one campus and, therefore, no questions were proposed concerning variation of citation patterns among campuses or types of institutions. However, as the study progressed and papers were collected from two similar pairs of institutions, a comparison of papers from large universities and liberal arts colleges proved possible. Tables 1-4 compare in a general way, the papers from liberal arts colleges versus those from the universities. The tables showing publication dates of books and journals are based on the "average oldest" and "average most recent" citations from the respective groups of



**TABLE 1**  
PERCENTAGE OF CITATIONS BY FORMAT

	% of Books	% of Journals	% of Other
University (N=1161)	52	38	10
Liberal Arts College (N=614)	59	27	14

**TABLE 2**  
AVERAGE NUMBER OF CITATIONS BY FORMAT

	Books Aver.	St. Dev.	Jrnls. Aver.	St. Dev.	Other Aver.	St. Dev.	Total Aver.	St. Dev.
University	4.4	3.89	3.2	6.90	0.9	2.56	8.5	8.53
Liberal Arts College	3.3	3.04	1.5	2.58	0.8	1.51	5.6	3.61
<b>TOTAL</b>	4.0	3.66	2.6	5.84	0.9	2.26	7.5	7.35

**TABLE 3**  
PUBLICATION DATES—BOOKS

	Oldest Date	Median Date	St. Dev.	Newest Date	Median Date	St. Dev.
University	1955.5	1966	37.24	1980.2	1983	14.81
Liberal Arts College	1955.7	1965	39.34	1979.4	1982	11.20
<b>TOTAL</b>	1955.6	1966	37.90	1979.9	1983	13.78

**TABLE 4**  
PUBLICATION DATES—JOURNALS

	Oldest Date	Median Date	St. Dev.	Newest Date	Median Date	St. Dev.
University	1971.8	1978	18.51	1980.5	1985	11.31
Liberal Arts College	1982.1	1985	9.58	1984.7	1987	6.53
<b>TOTAL</b>	1975.0	1981	16.95	1980.7	1985	33.87

papers. In these tables, the median is used to provide a more informative statistic for distributions with large standard deviations. In some tables, the mean was used instead so that t-tests could be performed.

Tables 1-4 make it appear that liberal arts college students cite slightly older books, slightly newer journal articles, and fewer sources of every kind. However, these comparisons may be unfair because the distribution by discipline and by course level is not the same for both groups of students.

Since variations have already been detected

among disciplines and levels of courses, the following additional analysis is limited to those situations where two different types of institutions provided enough papers in the same discipline to make comparisons at the same course level. The only groups of papers meeting these requirements were junior-level business (42 papers from one liberal arts college; 35 papers from one university); freshman-level religion (84 papers from one college; 27 papers from one university); and junior-level sociology (25 from one college; 210 from one university).

In the junior-level business courses (Table 5),



**TABLE 5**  
COMPARISON OF JUNIOR-LEVEL BUSINESS COURSES

	Liberal Arts College		University		<i>t</i>	Prob.
	Mean	St. Dev.	Mean	St. Dev.		
No. of citations	3.9	2.73	7.8	4.95	-4.31	.0001
No. of books cited	1.9	1.83	3.0	2.91	-1.88	.0641
Oldest book	1965.4	17.51	1976.0	8.26	-2.73	.0087
Newest book	1977.4	10.94	1983.6	2.22	-2.75	.0083
No. of jrnl. cited	1.5	3.09	1.8	2.87	-0.40	.6880
Oldest journal	1985.2	2.52	1981.5	4.09	2.98	.0057
Newest journal	1986.8	0.86	1983.4	3.73	3.34	.0022
No. other formats	0.4	0.83	3.1	3.73	-5.03	.0000

**TABLE 6**  
COMPARISON OF FRESHMAN-LEVEL RELIGION COURSES

	Liberal Arts College		University		<i>t</i>	Prob.
	Mean	St. Dev.	Mean	St. Dev.		
No. of citations	6.4	3.40	4.7	7.39	1.58	.1167
No. of books cited	5.4	3.18	2.7	4.96	3.23	.0017
Oldest book	1939.5	60.36	1964.7	15.95	-1.70	.0920
Newest book	1980.1	5.59	1979.2	4.59	0.67	.5075
No. of jrnl. cited	0.0	0.00	0.9	2.34	3.80	.0003
Oldest journal	—	—	1978.4	11.69	—	—
Newest journal	—	—	1983.3	3.30	—	—
No. of other formats	1.1	1.25	0.7	1.48	-1.14	.2560

**TABLE 7**  
COMPARISON OF FRESHMAN-LEVEL SOCIOLOGY COURSES

	Liberal Arts College		University		<i>t</i>	Prob.
	Mean	St. Dev.	Mean	St. Dev.		
No. of citations	5.8	2.60	7.0	4.58	-1.38	.1682
No. of books cited	2.4	2.83	4.0	2.83	-2.69	.0077
Oldest book	1973.5	12.91	1962.1	23.12	2.07	.0399
Newest book	1983.0	5.68	1982.2	6.50	0.51	.6096
No. of jrnl. cited	1.3	2.04	2.5	4.17	-1.38	.1682
Oldest journal	1985.5	2.02	1976.9	11.25	2.51	.0137
Newest journal	1986.9	0.70	1983.7	5.93	1.79	.0761
No. of other formats	1.9	2.38	0.56	1.15	4.83	.0000

the papers from the university included longer bibliographies with citations to new books, older journal articles, and many more "other" formats.

The papers produced in freshman-level religion courses (Table 6) showed fewer differences than the business papers. The liberal arts college students cited more books than the university students, but they cited no journal articles at all, compared to an average of .9 articles cited per paper by the university students.

The pattern of citation in junior-level sociology

courses (Table 7) was different still from any of the other two groups chosen for additional analysis. The university students cited more books, older books, older journals, and fewer other formats than did the liberal arts college students.

### Conclusions

The purpose of this study was to gain basic knowledge, rather than to change particular practices in the libraries studied. This entire study



answered general questions about the nature of materials cited regarding age and type of material, and differences among disciplines and institutions. It would have been interesting to view the citations produced in the context of each individual professor's assignments, instructions, and emphases, but that was not undertaken in this study. We experienced difficulties in collecting the citations themselves. Attempts to gather further information about prescriptions surrounding term paper production might also be elusive. However, we encourage others to conduct such structured and controlled studies at a variety of institutions for a variety of disciplines. A great deal remains to be learned about how undergraduates use the library in their educational pursuits.

The larger journal collections of the university libraries reveal themselves in the results with university students using journals 38% compared with liberal arts college students' 27%. Over half of the 10% difference appeared in the use of monographs with the remaining 4% in other. University students also averaged more citations per paper (8.5

to liberal arts college students' 5.6. For books, oldest median dates and newest median dates were essentially the same for both groups. For journals, the university students used older materials both in average newest and median newest. This finding probably reflects the size and complexity of large research collections and their practice of rarely, if ever, weeding older materials. Research collections tend to be more archival and inclusive in their natures than do small college collections.

Because patterns of use differ, this study should probably be replicated in other types of institutions. Large, multi-purpose research institutions and state colleges might yield results different from those of science and technology-oriented universities and small liberal arts colleges with religious affiliations. As resources for education become increasingly scarce, it is incumbent on librarians to be as well informed as possible about how their collections support learning. Basic research like this provides a baseline for more applied research, which ultimately contributes to improving practice in librarianship. ■ ■

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## Union Carbide signs agreement with Wei T'o Associates

An exclusive agreement for the use of Wei T'o Associates, Inc., preservation technology has been signed by the Union Carbide Chemicals and Plastics Company (UCC&P). The Specialty Chemicals Division of UCC&P is assessing various marketing and facility options to provide archives, libraries, museums, and other institutions in the United States and internationally with preservation services. The Wei T'o process complements Union Carbide's parylene technology for strengthening embrittled paper.

Richard D. Smith, president and founder of Wei T'o, said that Wei T'o technology involves the use of a nonflammable system that impregnates paper with a non-toxic magnesium carbonate complex. This neutralizes acids, prevents future acid development, and potentially prolongs the life of paper from 200 to 300 years. More information on the Wei T'o process may be found in "Mass Deacidification: The Wei T'o Way," *C&RL News*, December 1984, pp. 588-93.

"The magnitude of the U.S. paper preservation problem is staggering," said Smith. "Many of the 300 million books in research libraries in the U.S. alone are too brittle to be in general circulation. Most of the others contain paper that is likely to embrittle and more books containing degradable paper are being printed every day. These books will be lost if they are not protected."

Union Carbide's parylene process, commercial-

ized in the mid-1960s, has been used primarily in the electronics, defense and aerospace industries, where it forms an almost imperceptible plastic conformal coating that protects materials from many types of environmental problems. A typical parylene protective coating is about 1,000 times thinner than a plastic sandwich bag.

According to Smith, the Wei T'o process was first perfected 21 years ago. It has been used to preserve such documents as the Declaration of Independence, the Emancipation Proclamation, the Treaty of Paris, and the U.S. Constitution, in addition to numerous works of art and more than 2,500 letters written by Abraham Lincoln. The National Archives of Canada and the National Library of Canada have been treating up to 20,000 books a year using the Wei T'o technology.

Smith expects to use a portion of his future royalty income to establish a not-for-profit foundation to support graduate research on the preservation of archive, library, and museum materials. ■ ■

