



Article

A Citation Analysis of the Classical Philology Literature: Implications for Collection Development

Gregory A. Crawford
Director, Penn State Harrisburg Library
Middletown, Pennsylvania, United States of America
Email: gac2@psu.edu

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Abstract

Objective – This study examined the literature of classical (Greek and Latin) philology, as represented by the journal *Transactions of the American Philological Association (TAPA)*, to determine changes over time for the types of materials cited, the languages used, the age of items cited, and the specificity of the citations. The overall goal was to provide data which could then be used by librarians in collection development decisions.

Methods – All citations included in the 1986 and 2006 volumes of the *Transactions of the American Philological Association* were examined and the type of material, the language, the age, and the specificity were noted. The results of analyses of these citations were then compared to the results of a study of two earlier volumes of *TAPA* to determine changes over time.

Results – The analyses showed that the proportion of citations to monographs continued to grow over the period of the study and accounted for almost 70% of total citations in 2006. The use of foreign language materials changed dramatically over the time of the study, declining from slightly more than half the total citations to less than a quarter. The level of specificity of citations also changed with more citations to whole books and to book chapters, rather than to specific pages, becoming more prevalent over time. Finally, the age of citations remained remarkably stable at approximately 25 years old.

Conclusion – For librarians who manage collections focused on Greek and Latin literature and language, the results can give guidance for collection development and maintenance. Of special concern is the continuing purchase of monographs to support research in classical philology, but the retention of materials is also important due to the age and languages of materials used by scholars in this discipline.

Introduction

Citation analysis has been a mainstay in the literature of librarianship and information science. A search for the term “citation analysis” in *Library Literature & Information Science Index* produced by H. W. Wilson results in a list of over 1,600 articles for the years 1981 to 2012. When combined with the search term “collection development,” however, the results shrink to less than 60 articles. Outside the field of librarianship and information science, citation analysis is used in a variety of fields, especially to determine leading journals, influential articles, and major authors. A search of *PsycInfo* via APA PsycNet yielded over 240 articles containing the phrase “citation analysis” for the period 1927 until 2012. Even the *MLA* (Modern Language Association) *International Bibliography* database includes several articles that contain the phrase “citation analysis.” In contrast, a search of the *L'Année philologique on the Internet* database covering 1924 to 2011 (the latest update) retrieves no articles specifically on citation analysis within the field of classical studies. *L'Année philologique* is the primary database for the literature of the field of classical studies and currently indexes approximately 1,500 journals.

This research seeks to rectify this lack of research by examining citation patterns in classical studies, specifically classical philology, through an analysis of articles in the *Transactions of the American Philological Association*, usually referred to as *TAPA*. Classical philology has a broad definition which covers most of the fields that are included in the domain of classics or classical studies including literature, languages,

history, philosophy, art, religion, and material culture. Of specific concern, however, is the study of literary and philosophical texts produced by the ancient Greeks and Romans.

Literature Review

The literature on citation analysis and its variants such as co-citation analysis has a long and storied history. According to Broadus (1977), librarians have long used citation analysis for collection building and management. Similarly, Bowman (1991) argued that citation patterns could be used as one method for deciding the suitability of specific items for inclusion in a library's collection. Of special interest to Bowman were the formats cited (for example, books and journals), languages of items cited, and the age of items cited. Many researchers have studied specific fields to determine how citation analysis can be applied to collection development. For example, Zhang (2007) examined the field of international relations, determining that monographs made up almost half the cited materials while journals contributed almost 40%. The vast majority of items cited were written in English, with foreign languages accounting for less than 4% of the total citations. Liu (2007) applied citation analysis to the field of educational psychology. He specifically studied the clustering of specialties in educational psychology and stated that studies such as his “can inform librarians doing selection of journals ... to meet their specific needs” (p. 117). In an earlier article, Hitchcock (1990) examined the use of research materials in a single historical journal. She wrote:

Citation analysis is a valid method of measuring the use of materials since it takes advantage of the author's attempt to substantiate the findings of the research based on documented evidence. As a collection development tool, it benefits from the citation's function of providing sources of further information on a subject. It is a reliable method as the data are readily available in print and not subject to response variables as are questionnaires. (p. 53)

Hitchcock concluded her article, "Libraries can best serve researchers of state and local history by becoming aware of the researchers' use of primary sources, and providing services which will satisfy their information needs" (p. 54). This is also true of researchers in all academic fields.

Budd and Christensen (2003) examined the social sciences to see how expanding access to electronic information resources had changed citation patterns. They found that within the eight journals from the social sciences that they included in their analysis, few electronic resources were cited. In particular, they found that almost 47% of the citations were to journals and another 44% were to books. They wrote, "One inference that might be drawn from this indicator is that, for the time being at least, the academic world adheres to formal and traditional media for communication" (p. 645).

Several authors have examined the field of classical studies, often in combination with other fields of the humanities. In a trio of articles, Kellsey and Knievel (2004), Knievel and Kellsey (2005), and Kellsey and Knievel (2012) studied citation patterns in various humanities fields, including classics. In their first article (Kellsey & Knievel, 2004), the primary goal was to determine the use of foreign languages by examining the citations in representative journals for a span of 50 years. In total, they counted 16,138 citations from 468 articles in 4 journals from history, classics, linguistics, and philosophy. For classics, they used the *American*

Journal of Philology as their source. The results for this journal indicated that the use of foreign language materials had declined from 1962 to 2002. In 1962, over 45% of all citations were to foreign language materials while in 2002 slightly over 21% were to foreign language items. In their 2005 article, the authors analyzed 9,131 citations from the 2002 volumes of journals in eight humanities fields, including classics. Again, citations from the *American Journal of Philology* were used as the source of data for the field of classics. This study broadened the scope of the analysis to include formats of materials studied as well as language. That particular volume of the *American Journal of Philology* yielded 996 individual citations with an average of 39.8 citations per article. Over 76% of the citations were to monographs while slightly over 33% were to journals. Almost 80% of the citations were to English language materials. Finally, in their 2012 article, they examined citations from 28 monographs published by humanities faculty members with the goal of determining how these scholars accessed the materials they used. Specifically, they queried whether the sources were owned by the faculty member's academic library, how they were acquired (approval or firm order), their average age, and interdisciplinary usage as determined by the LC classification of the cited item.

For the field of classics, especially classical philology, two pieces of research stand out, Tucker (1959) and Dabrishus (2005). Both of these master's papers were written at the University of Chapel Hill. Tucker's goal was "to ascertain certain of the characteristics of the literature used by researchers in the field of classical philology" (p. 1) by studying the literature cited in the *Transactions of the American Philological Association*. Among the characteristics he examined were the form of publication, the age of the literature cited, the specificity of the citation, and the use of foreign language publications. Tucker's analysis included a total of 1,327 citations drawn from 33 articles in two volumes of *TAPA*, volume 87 (1956) and volume 88 (1957). He only counted

those citations to secondary sources, not the primary sources that were often the focus of the article itself. For example, the original text of Euripides was not included in the citation analysis, but works *about* the text were included. Specific results from Tucker's research are discussed below in the results section. Dabrush studied the citations included in three classic journals: *The Classical Quarterly*, *Classical Antiquity*, and *Mnemosyne*. Although she focused primarily on the use of periodicals, she did note that monographs were cited heavily, accounting for 76% of all citations, while periodicals received only 24% of the citations in her analysis. The three most frequently cited journals were *The Classical Quarterly*, *Bulletin de correspondance hellénique*, and *Transactions of the American Philological Association*. In total, the articles in the three journals included in the study cited 120 different journals of which over half were cited more than one time each.

Aims

The overall goal of this research was to study changes over time in the way scholars have used the literature of classical (Greek and Latin) philology. Based on previous research, the journal *Transactions of the American Philological Association (TAPA)* was used for the analysis and this study attempted to determine changes over time for the types of materials cited (e.g., monographs and journals), the languages of the cited materials, the age of the items cited, and the specificity of the citations. The results of the analyses provide data which may be used by librarians in making collection development decisions, especially the allocation of resources for monographs and journals in classical studies, the discarding of materials which are no longer relevant, and the placement of materials in storage.

Methods

In order to understand how citation trends in classics have changed over time, the current research sought to replicate and update the

research performed by Tucker (1959). All citations to secondary sources from articles published in *TAPA* for the years 1986 and 2006 were compiled into a spreadsheet. The use of these two years of *TAPA* helped determine if there had been significant changes over time in the citation patterns for this specific journal, especially when compared to the original research which analyzed citation data drawn from the 1956 and 1957 volumes of *TAPA*. In addition, using citations from the 2006 volume provided a way to determine the extent to which scholars in this field cite identifiable electronic resources (other than journals which, while electronically available, are usually cited as if they were used in a print version).

Every citation included in each article appearing in the 1986 and 2006 volumes of *TAPA* was examined and only those from secondary sources, that is, not the original texts being discussed in the article itself, were included in the analysis. Citations to original Greek and Latin texts were, therefore, not included in the analysis. The data for each citation included the name(s) of the author(s), the title of the publication, the type or format of publication, the date of publication, the language of the publication, and the specificity of the citation. In addition, the age of the citation was determined by subtracting the date of the publication from the year in which the source article appeared in *TAPA*. As determined by Tucker, the type of publication included the following formats: book/monograph, journal/periodical, annual/yearbook, encyclopedia/dictionary, Festschriften, dissertation/thesis, and other. The current research added electronic sources for the 1986 and 2006 articles. Languages of citations included English, German, French, Italian, Latin, Greek, and Spanish. Following the work of Tucker, specificity focused on the length of the citation, i.e., 1 page, 2-10 pages, over 10 pages, an entire article (of a journal, annual, etc.), an entire book, a book chapter, and other. All citations to secondary materials were entered into the analysis, including *ibid.* and *op. cit.* citations.

Results

In his research, Tucker (1959) did not separate his results by year. Thus, in the following tables and discussion, his results are given as he presented them, consolidating both years of his study into one set of data. In the two volume years of *TAPA* that he included in his study, Tucker examined 1,327 citations drawn from 33 articles, an average of 40.21 citations per article. As shown in Table 1, the current research examined 34 articles and 3,323 citations. In 1986, there were 20 articles that included 1,421 citations, an average of 71.05 citations per article. By 2006, the number of articles had declined to 14, but the total number of citations had ballooned to 1,902, an average of 135.86 citations per article. Thus, there is a statistically significant increase in the average number of citations per article between the 1956/57 and the 1986/2006 data ($t=4.542$, $p<.001$). In fact, there is also a statistically significant difference between the 1986 and the 2006 average number of citations per article ($t=-2.598$, $p=.014$). These results show that the number of items cited by authors of articles had grown considerably between 1956 and 2006. More recent authors cited more than 3 times as many sources as authors during the 1950s.

Table 2 provides a breakdown in the types of publication cited in the examined articles. A chi-square test results in a statistically significant result (chi square=358.63, $p<.001$, $df=12$) indicating that the types of publications cited had changed significantly over the time span. In 1956/57, books and monographs accounted for 54.8% of the citation. This percentage grew to 67.2% in 1986 and 68.6% in 2006. Citations to journals and periodicals remained fairly stationary (1956/57: 28.5%; 1986: 26.9%; and 2006: 29.7%). Major changes are observed for the remaining types, except for other. Citations to annuals and yearbooks fell from 9.6% of citations in 1956/57 to only 0.2% in 2006. Similarly, citations to encyclopedias and dictionaries fell from 3.6% in 1956/57 to 0.3% in 2006. Citations to *Festschriften* and dissertations likewise fell dramatically over the timespan of the study. There is only one citation to an electronic resource in 2006, although by then the Internet and World Wide Web had been publicly available for well over a decade. This may be misleading, however, since many journals in the field of classical studies, especially philology, had been available electronically for many years prior to 2006. The authors may have used electronic sources, but not cited them as such.

Table 1
Citations per *TAPA* Volume

TAPA Volume & Year	Number of Articles	Number of Citations	Average Citations per Article
87 (1956) & 88 (1957)	33	1327	40.21
116 (1986)	20	1421	71.05
136 (2006)	14	1902	135.86
Total	67	4650	69.4

Table 2
Format of Materials Cited

TAPA Volume & Year	Format								Total
	Book/ Monograph	Journal/ Periodical	Annual/ Yearbook	Encyclopedia/ Dictionary	Festschriften	Dissertation/ Thesis	Other	Electronic Source	
87 (1956) & 88 (1957)	727	378	128	48	26	16	4	0	1327
116 (1986)	955	383	17	28	15	9	14	0	1421
136 (2006)	1304	564	3	6	9	3	12	1	1902
Totals:	2986	1325	148	82	50	28	30	1	4650

** "Other" includes newspapers, conference proceedings, and government documents

A total of 935 different books or monographs were cited by the 1986 and 2006 articles. In 1986 there were 387 different books cited, while in 2006 there were 562. Several books were cited in both years. Tucker, unfortunately, did not list the total number of different books cited but only included the total number of citations to books.

Of particular interest are the journals and periodicals which were cited within these articles. Table 3 gives a breakdown of the ten titles which received the greatest number of citations for each year included in the study. The chart is arranged alphabetically with the number of citations given to that specific journal during each of the study years given in the columns. As can be seen, of the eighteen journals listed, only four were in the top ten for all three years: *American Journal of Philology*, *Classical Philology*, *Hermes*, and *Transactions of the American Philological Association*. Four others were in the top ten for two years: *Arethusa*, *Classical Journal*, *Classical Quarterly*, and *Journal of Hellenic Studies*. Of these, *Arethusa* did not begin publication until 1968, well after Tucker's study. Of the top

10 journals cited in the 1956 and 1957 volumes, only one (*Byzantinische Zeitschrift*) was not cited by any of the articles in the later volumes of *TAPA*. Tucker does not provide a listing of all the journals cited during the years of his study, but for 1986 and 2006 a total of 119 different journals received citations. In 1986, there were 93 different journals cited and in 2006, 101 different journals were cited. Thus, it is evident that scholars in the field of classical philology cast a wide net when utilizing the research literature.

The language of the sources of citations also changed significantly over time (chi-square=601.40, p<.001, df=14). Table 4 shows that English was, by far, the most frequently cited language for all years, accounting for 67.5% of all citations included in the study. In contrast, for the years 1956 and 1957 English accounted for less than half of the citations while German received 31.1% and French 11.3%. By 1986, German and French witnessed dramatic declines with German accounting for 23.9% and French for 6.3% while English grew to 67.2%. For the 2006 articles, English grew even more,

accounting for 83.2% of the citations. German and French continued to decline (8.4% and 3.3% respectively) and Italian increased slightly in comparison to the 1986 citations (3.0% in 2006 compared to 2.5% in 1986), yet did not approach the 7.7% in 1956 and 1957.

The level of specificity of citations also changed significantly over time (chi-square=168.13, $p < .001$, $df=12$). As shown in Table 5, citations to a single page remained fairly steady over time, while citations to 2-10 pages declined as a percentage of the total citations. The major changes were in the number of citations to entire books and to book chapters, both of which grew greatly over the period.

Finally, the study examined the age of the citations. Table 6 gives the age breakdown of citations using the time spans originally

established by Tucker in his research. The age of the citation was determined by simply subtracting the publication year of a citation from the volume year of *TAPA*. For example, if an item being cited by an article in volume 136 (2006) was published in 1997, the age of the citation was recorded as 9 years old. In contrast to the other changes noted above, the average age of citations remained very stable over time. For the 1956-1957 citations, the average age was 25.23 years. For the 1986 citations, the average age was 24.53 years and for 2006, the average age was 24.63 years.

Discussion

This study of citations to the literature of classical philology support several observations. Authors of articles included in *TAPA* rely heavily not only on the literature of the field of classical philology, but also on the literature of

Table 3
The Ten Most Cited Journals by *TAPA* Volume

Journal	Vol. 87 (1956) & 88 (1957)	Vol. 116 (1986)	Vol. 136 (2006)
American Journal of Archaeology		24	
American Journal of Philology	35	16	23
Arethusa		13	22
Byzantinische Zeitschrift	9		
Classical Antiquity			17
Classical Journal	31	12	
Classical Philology	12	11	69
Classical Quarterly	12	29	
Classical Review	11		
Greece & Rome			19
Harvard Studies in Classical Philology		24	
Hermes	17	36	18
Journal of Hellenic Studies		13	35
Philologus	12		
Phoenix			24
Proceedings of the Cambridge Philological Society			17
Rheinisches Museum für Philologie	11		
Transactions of the American Philological Association	63	19	38

Table 4
Language of Citations

TAPA Volume & Year	Language								Total
	English	German	French	Italian	Latin	Greek	Spanish	Other	
87 (1956) & 88 (1957)	604	413	150	102	44	9	1	4	1327
116 (1986)	955	340	89	35	1	1	0	0	1421
136 (2006)	1583	160	63	58	18	15	5	0	1902
Total	3142	913	302	195	63	25	6	4	4650

Table 5
Specificity of Citations

TAPA Volume & Year	Specificity							Total
	1 page	2-10 pages	Over 10 pages	Article (of journal, annual, etc.)	Book	Chapter in Book	Other	
87 (1956) & 88 (1957)	497	496	35	215	70	11	3	1327
116 (1986)	463	474	62	213	114	91	4	1421
136 (2006)	762	511	138	210	174	106	1	1902
Total	1722	1481	235	638	358	208	8	4650

related fields such as history, philosophy, and archaeology, as shown in the growth in the variety of items cited. According to the articles included in the study, the average number of citations more than tripled from 1956 and 1957 until 2006, indicating a greater reliance on previously published literature. It is difficult to speculate on all the reasons for this increase in the number of citations, especially considering the similarity in the length of the articles over the years, although the training of scholars in the humanities emphasizes the necessity of building upon the work of previous scholars. The availability of materials, especially journals through a variety of electronic databases and the

ease of interlibrary loan, may have made resources more readily available to scholars, thus increasing the amount of material used in more recent research.

The types of materials cited, while similar, did show statistically significant changes. Specifically, the citations to books increased dramatically, from 54.8% of the total citations in 1956 and 1957 to 68.6% in 2006, although this is still less than the 76% reported by Dabrishus (2005). Such growth in the number of citations to monographs is a surprising finding when one considers the growth in the use of journals shown by most scholarly fields. The finding does underscore the monographic nature of the

field of classical studies and the continuing importance of books to scholars within the humanities.

Within *TAPA* articles, citations to journals remained fairly steady at slightly less than 30%. The use of other materials, such as encyclopedias and *Festschriften*, all declined, although their numbers represented a relatively

small percentage in the types of materials cited during all years. One surprising result was the lack of specific citations to electronic resources, especially considering the tremendous growth of websites, e-only journals, online encyclopedias, etc. Only one purely electronic resource was identified in this study, although many of the journals and monographs could have been accessed through electronic databases.

Table 6
Age of Citations

Age of Citations				
Age in Years	Vol. 87 (1956) & 88 (1957)	Vol. 116 (1986)	Vol. 136 (2006)	Total
0-5	283	292	164	739
6-10	181	203	352	736
11-15	96	161	345	602
16-20	144	233	256	633
21-25	85	126	162	373
26-30	95	63	139	297
31-35	77	43	106	226
36-40	46	30	110	186
41-45	39	14	73	126
46-50	55	21	50	126
51-75	138	124	73	335
76-100	39	88	45	172
100+	47	20	27	94
No date	2	3	0	5
Total	1327	1421	1902	4650

The analyses also show that a wide variety of books and journals were cited. Thus, for developing a collection to support research in classical philology, books remain an important mainstay for scholarly work. Such books include not only commentaries on specific classical authors, but also works on art, archaeology, literature, and philosophy. The array of journals consulted is also very broad, although there is a fairly small core of journals which received heavier use. Thus, librarians have evidence that providing the core set of journals will provide a large proportion of the materials actually cited by classical scholars in their research. This result can help determine how to spend the scarce resources available for collection development.

The utilization of foreign language materials has greater implications for collection development and maintenance. In 1956 and 1957, English language materials accounted for only about half of the citations. By 2006, English materials represented 83.2% of all citations. During this time frame, the use of foreign language materials declined precipitously. For example, German language materials declined from 31.1% of all citations to 8.4% and French declined from 11.3% to 3.3%. These changes, however, may be deceiving, since many materials, especially books, may have been translated into English from the other languages in more recent years. Still, these changes do show that scholars in the field of classical philology rely heavily on materials in English. These results mirror those found by Kellsey and Knievel (2004) and Knievel and Kellsey (2005), although the *American Journal of Philology* cited a higher proportion of foreign language materials than did *TAPA*. As a result of such evidence, for many libraries collection development in the field of classical philology should focus primarily on English-language materials, although the evidence also reiterates the need for access to a wide variety of materials in other languages which may be provided through interlibrary loan or databases of foreign-language journals.

The specificity of citations has also changed over time. The main change is the dramatic increase in the number of citations to whole books and to chapters in books. This mirrors the results for the types of materials cited and shows an increased usage of monographs, indicating that the demand for scholarly monographs in classics continues to be high. Tucker (1959) says, "The longer, more exhaustive treatment which a book can afford a topic could be a considerable factor in the most frequent choice of this form" (p. 16).

The most striking result of the present study is the consistency in the average age of citations within this field of approximately 25 years old. As Tucker (1959) notes, "The researcher in this field perhaps does not feel so constrained to consult the most current literature" (p. 14). The field of classics in its broadest sense has a long history, stretching back centuries, and obsolescence of scholarly ideas is low. As can be seen from the age analysis, even materials from the nineteenth and early twentieth centuries are still cited by scholars. Such citation patterns have major implication for retention policies. If scholars are regularly using such older materials, these books and journals need to be available. This could call into question the weeding of older books and journals or their placement in remote storage facilities. Digitization of these older materials could also help solve the problems of storage.

Conclusions

The study of citation patterns can provide the scholar and the librarian with varied insights into selected fields. This study sought to replicate and expand an earlier study and provides useful information on how scholars in the field of classical philology use sources in their research. The results, of course, are limited to only one scholarly field and cannot be generalized to other subjects. Similar methodology, however, has been used frequently in the study of other fields. The results from this study and others can help librarians in their pursuit of providing materials

needed by scholars for their research. Of special concern is the retention of materials. In the case of classical philology, scholars make use of materials from a wide time span written in a variety of languages, although more recent research has relied increasingly on English language materials. In addition, they are heavy users of monographs, yet they still use a wide array of journal titles. Thus, such materials need to be retained in research library collections. Unlike other fields, especially in the sciences, which rely more heavily on current journals, classics continues to rely on both monographs and journals and ideas expressed in older materials can still have immense relevance to current research. As a result, librarians cannot make blanket decisions for retaining materials, such as format or age. They must consider the nature of the use of materials by subject discipline.

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