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A bibliometric analysis of introductory public speaking textbooks in higher education

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ABSTRACT

A BIBLIOMETRIC ANALYSIS OF INTRODUCTORY PUBLIC SPEAKING TEXTBOOKS IN HIGHER EDUCATION

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The publication of a new edition of a textbook affects the effort required by authors to update the text, the costs incurred by students to buy or rent the book as well as the time required by instructors to update course materials. This study investigated the extent that the number, age, and type of references changed across editions of introductory public speaking textbooks using 43,094 references from 177 editions of 28 titles published since 1970. Patterns based on copyright date and edition number were examined controlling for the number of pages in the title and whether references were found in footnotes or bibliographies.

The analysis found that the number of references increases over time, increases with each edition, and is greater when footnotes are used rather than a bibliography. The age of references is unrelated to the edition of the title but, as the copyright year increases, so does the age. Significant differences exist in the mix of references used by authors. Across time, the percentage of books and magazines used by authors decreased, but the percentage of internet, journal, and newspaper references increased. As a result, students may want to save money by buying an older edition and instructors may want to save time by not adopting new editions. Research in this area would be facilitated if introductory books were included in citation indices.

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A BIBLIOMETRIC ANALYSIS OF INTRODUCTORY PUBLIC SPEAKING TEXTBOOKS IN HIGHER EDUCATION

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CHAPTER 1

INTRODUCTION

Every few years, instructors may be faced with the decision to adopt a new edition of a textbook, switch to a different textbook, or use the soon-to-be-out-of-print edition. The decision affects the effort required by authors to update the text, the costs incurred by students to buy or rent the book as well as the time required by instructors to update course materials such as lectures, assignments, and exams. A change might also affect the availability of up-to-date material, supplemental educational tools such as online assessment, or alternative modes of delivering the textbook such as various electronic versions of the book. The decision affects the profitability of publishers. In fact, Li (2011) argues that publishers have an economic incentive for planned obsolescence that takes advantage of the issues instructors face in adoption decisions. This explains why new editions of a textbook are issued on a regular basis, usually every three years. Finally, librarians may also be affected by decisions about adopting a new edition of a textbook.

Background on the Problem

Faculty can evaluate a textbook under consideration for adoption for a course in higher education in many ways. Typically, the choice is between a new edition of a previously used book, or some other book in the field. Whatever the decision, students are left to endure the decision. From an author's or publisher's perspective, the issue involves the amount of change

that must be made to a new edition in order to encourage faculty to adopt it, students to buy it and libraries to add it to their collection. The decision involves significant financial and educational consequences.

Student Issues

Textbook prices constitute a significant and rapidly increasing expense associated with attending college. The College Board's annual survey (2013) found that the average estimated full-time student spent over $1200 on textbooks per year. According to the General Accounting Office (2013), from 2002 to 2012, textbook prices increased at an average rate of 6% while the general inflation rate only increased an average of 2%. Over this time period, textbooks prices rose 82% while overall consumer prices increased only 28%. A similar trend was found by an analysis of the GAO in 2005.

High textbook prices negatively affect students in two major ways: They do not purchase the text and risk a lower grade in a course or they cannot afford school altogether. Research by Senack and The Student PIRGs (2014) uncovered that

> 65% of students said that they had decided against buying a textbook because it was too expensive. The survey also found that 94% of students who had foregone purchasing a textbook were concerned that doing so would hurt their grade in a course. More than half of the students felt *significant* concern for their grade. (p. 4)

Leslie and Brinkman (1988) found "enrollments would probably decline from 1.8 percent to 2.4 percent for every $100 price increase" (p. 132). In addition, Heller (2001) found

> In general, African American, Hispanic, and low-income students tend to be more price responsive (i.e., are less likely to enroll in college, or change the type of institution in which they enroll, in the face of tuition increases) than are white and middle- and upper-income students. (p. 8)

Heller continued to note that "enrollments at community colleges tend to be more price

responsive than enrollments in four-year institutions, though much of this effect appears to be because of the disproportionate share of lower-income students who enroll in community colleges" (p. 8). This situation is likely to increase future unemployment since, as Nguyan (2010) wrote, "over 80 percent of the millions of jobs created in the next ten years will require postsecondary education" (p. 106).

After students graduate, student debt contributes to post-graduation employment choices and willingness to donate to an educational institution as an alumnus. Rothstein and Rouse (2007) studied a wealthy, highly selective university that, in the early 2000s, substituted grants for loans in financial aid awards. They found that, with regard to employment, "an extra $10,000 in student debt reduces the likelihood that an individual will take a job in nonprofits, government, or education by about 5 to 6 percentage points" (p. 25). Ambrose, Cordell, and Ma (2015) found a significant correlation between student debt and starting a small business. Based on their results, "the marginal effect of an increase of one standard deviation in the relative student debt use (from 2.5% to 5.2%) results in a decrease of 12% in the number of net firms (from 737 to 649)" (p. 18).With regard to willingness to donate to the institution after graduation, debt did not affect pledge amounts made in the student's senior year but "debt does appear to have negative effects on whether students actually give (on the order of 3 percentage points per $10,000 in loans), though these are only marginally statistically significant (p-value 0.07 for year 1, 0.13 for year 2)" (p. 31).

Parental Issues

Parents also bear some of the burdens of high educational costs. According to research by Sallie Mae (2015), the income and savings of parents on average pays for 32% of the total cost

of college for a typical family and in 2015 became the largest source of funds to pay for college, "exceeding scholarships and grants for the first time since 2010" (p. 7). Borrowing by parents covers another 6% of the total cost. To cope with these financial demands, the Sallie Mae survey found 45% of parents decreased spending and 19% worked more. Besides these behavioral responses, parents also experienced emotional responses. Although not directly tied to the cost of books but to other analogous components of the cost of education, the survey reported that parents felt varying levels of extreme worry for different events affecting the cost of education. For example, 27% of parents felt extreme worry over the possibility that tuition would increase and 21% expressed extreme worry that scholarships and grants would be less available.

Faculty Issues

Three activities conducted by faculty are affected by textbook publication practices. These activities consist of writing textbooks, using textbooks to teach, and researching textbook publication practices. Publication practices potentially affect faculty tenure, promotion, and pay decisions as well as the education of students and the ability to conduct research.

For Faculty Who Publish Textbooks

Contractual arrangements with publishers require faculty members who are authors to revise textbooks on a set schedule. Shelstad (2011) indicates that one strategy of the industry is to revise textbooks "as often as every 12–18 months to flush the market of available substitutes" (p. 255). More generally, Hewitt and Regoli (2010) write that "most lower-division textbooks are on two-, three-, or four-year cycles for new editions" (p. 334). This strategy is in contrast to "cycles of 4 to 5 years that were standard" around 1985 to 1995 (GAO, 2005). More specifically,

college-level, introductory, public speaking textbooks are typically revised every three years.

In order to meet the publication schedule, faculty must determine how much effort to put into the revision. Since the supply of time a faculty member has is finite, and the faculty member faces multiple demands to publish, teach, and provide service; he or she would ideally want to put in the minimum amount of work needed to revise a textbook. Unfortunately for textbook authors, once the text is in print, authors "may have only a few months' hiatus before beginning the process over again" (Hewitt & Regoli, 2010, p. 334). Part of the calculation of what constitutes the minimum amount of effort needed for a revised edition could be information on how much effort authors of competing textbooks put into the revisions of their textbooks. Zafrunnisha and Pulla Reddy (2010), for example, note that a bibliometric analysis can help researchers "know how far they must go back to obtain material in their field of interest" (para. 2). Perhaps another factor to consider by a faculty member is the weight put on a subsequent edition of a book for purposes of tenure, promotion or pay. Heilenman (1993) argues from personal experience that a textbook, perhaps mistakenly, carries little weight in these decisions. If the publication of a textbook is considered in tenure decisions, some schools consider it as part of teaching, not research. These considerations make an examination of book publication practices of interest to authors.

For Faculty Who Use a Textbook

A new edition of a currently used textbook poses several problems for faculty who use an earlier edition of that textbook. Continued use of the same edition affects the availability of up-to-date material, supplemental educational tools such as online assessments, or alternative modes of delivering the textbook such as various electronic versions of the book. Changing to a new

edition and, to a greater extent a new book, places demands upon the faculty member to change lecture and test material. Since switching to a new book can lead students to forgo purchasing the book, thus jeopardizing their learning (Senack and The Student PIRGs, 2014), faculty could experience fallout from these student actions in the form of criticism for lower success rates in their courses and receiving poorer evaluations by students of the class (Gray, 2008).

Even the decision to consider changing to a new textbook or a new edition involves a time-consuming process. Possible textbooks must be requested directly from publishers or through textbook representatives and some method of comparing the textbooks must be developed and applied to the various books. If the decision is made by a department or a committee, the process can become even more complex. More discussion would occur regarding the selection criteria and publishers might be invited to the school to deliver presentations on features of the book plus the availability of supplemental material, which will all take time.

Recently, the decision to change to a new book or a new edition brings with it legal requirements. Several states require that a faculty member or the faculty member's institution must certify that there are substantial changes to any new textbook adopted for a course. Although the laws provide some guidance as to what constitutes a substantial change, if a textbook does not clearly fit one of the specific categories spelled out in the legislation, faculty will need to provide other proof.

In Maryland, this information is spelled out in the *College Textbook Competition and Affordability Act of 2009*. Section (1)(D)(2) states that a faculty member selecting a new edition of a textbook shall acknowledge "the differences in substantial content between the current edition of the textbook and the previous edition of the textbook." Information on the supposed

differences is provided by the publisher with substantial content defined in the act as “a part of a college textbook, such as new chapters, new material covering additional eras of time, new themes, or new subject matter.”

Similar legislation exists in Florida. Title XLVIII of the K-20 Education Code, Chapter 1004.085 (2010) deals with textbook affordability and states the State Board of Education and the Board of Governors each shall adopt policies, procedures and guidelines

> that a course instructor or the academic department offering the course determines, before a textbook is adopted, the extent to which a new edition differs significantly and substantively from earlier versions and the value of changing to a new edition or the extent to which an open-access textbook may exist and be used.

The act does not provide a definition of what constitutes a significant and substantive difference, and neither does the relevant administrative code rule 6A-14.092 of the Florida State Board of Education (2009). However, in implementing the law and rule 6A-14.092, Palm Beach State College’s textbook certification tutorial (2015) indicates substantial content changes exist if the textbook contains more current data, updated instructional information, more effective technology resources, corrections in errors in past editions, or contemporary theory is included.

Weaker language is included in California legislation. Section 66406 of the California Educational Code (2007), rather than requiring faculty to certify or acknowledge changes to a new textbook, only encourages faculty to disclose how a new edition is different from a previous edition. The code does not require that the changes be substantial or define what kinds of changes should be disclosed.

For Faculty Conducting Research

When looking at the publishing industry, the issues for faculty and other scholars conducting research takes a different form than that for students or for faculty who author or use a textbook. Rather than the issue involving the textbook itself, the concern involves deficiencies in the resources used to study textbook bibliographies, especially in comparison to resources available to study the bibliographies of journals. These deficiencies make it harder to learn what references are cited by books and what references cite books. An entire research field involving citation analysis is hindered as a result. This research field is variously called bibliometrics, scientometrics, citation analysis, or altmetrics. Some of the uses of this research, as listed by McBurney and Novak (2002) include assessing how a particular work influences other research, exploring what material influenced a particular work or field of research, and determining who is conducting research in a field. From an educational perspective, bibliometrics can provide insight into the learning authors engaged in between the publication of different editions.

To understand this issue better, two points need to be understood. First, reference resources exist for tracking citations in journals, but similar resources for tracking citations in books are deficient. Second, bibliometric research on journals does not necessarily apply to books.

Several reference resources exist for tracking citations in journals. As Archambault and Gagné (2004) note, "bibliometrics really began to take off with the advent of SCI [Science Citation Index] in the 1960s" (p. 10). Thomson Reuters, the subsequent publisher of SCI, writes in a history of citation indexing that "the Web-based version of that index covers 5,600 journals across more than 150 scientific disciplines" (2015, para. 8). Thomson Reuters also published the

Social Sciences Citation Index (SSCI) which indexes 3,000 social science journals across 50 disciplines with back files to 1955 (Thomson Reuters, n.d.). At the time of this writing, both the SCI and SSCI were owned by Clarivate Analytics.

Before 2005, there were no reference works providing citation information on books and this was problematic. Archambault and Gagné (2004) reported that

> Ideally, SSH [Social Science & Humanities] bibliometric research evaluation should include data on articles and books, and indeed on other scientific communication media as appropriate to the field in question. Unfortunately, the Thomson ISI [Institute for Scientific Information] databases do not provide this type of coverage, and no other database provides it adequately. (p. 15)

This absence is no longer the case.

Since 2005, two references have been developed that might be used to conduct research on textbooks but both of these have deficiencies. These two references consist of the Book Citation Index produced by Clarivate Analytics and Google Books. Although the 50,000 books covered by the Book Citation Index represent an extensive number of books, the data base only includes graduate-level books and only goes back to 2005. As a result, data to study introductory college-level textbooks are missing and the ability to study several editions of a book is limited to the short time period since then.

In addition to the lack of resources, bibliometric research on scholarly journals does not necessarily apply to books. One difference involves books potentially covering material that is on the cutting edge of research. As Archambault and Gagné (2004) write, because researchers in the Social Sciences and Humanities approach the field from different paradigms, they are more motivated to publish books while the best research in the Natural Science and Engineering field is found in journal articles. Larivière, Archambault, Gingras, and Vignola-Gagné (2006) provide additional support for this point in concluding that the importance of journal literature is

increasing in the Natural Sciences but the role of journals is stagnant or slightly decreasing in several disciplines of the Humanities and Social Sciences with less than 50% of citations to journals in these disciplines.

The importance of journals is certainly a contested issue. First, this claim would seem to be truer for scholarly textbooks marketed toward scholars or targeted toward graduate-level classes rather than introductory textbooks. Second, the publication lag associated with books makes journals more relevant for recent research. Third, it is certainly the case that funding, tenure, and promotion decisions are based more on publication in journals rather than the publication of books (West & McIlwaine, 2002).

A second difference between journals and books involves their readership. Clemens, Powell, McIlwaine, and Okamoto (1995) argue that, in comparison to journals, books have a greater impact outside the discipline and are generally read by more people. In the case of introductory textbooks, the audience is focused on students, not scholars.

Third, journals typically provide original research whereas textbooks, especially introductory textbooks, typically provide a synthesis of research. According to Hassan and Becker (2007), "textbooks lay a crucial communicational role for disciplines by describing to their stakeholders and other disciplines the field's body of knowledge" (p. 169).

Fourth, regardless of the differences between journals and books, citations in books should be studied since books make up 40–60% of the literature in the social sciences based on an analysis by Hicks (1999). Additionally, the material cited in books varies from that cited in journals. In their research, Archambault and Gagné (2004) found 47% of references in journals were to other journals and 39% of references were to books while, with books, only 25% of

references were to journals and 51% were to other books (pp. 14-15).

Institutional Issues

Libraries are faced with two issues regarding new editions of a book. First, a decision has to be made about whether to purchase the new edition. Second, material in the bibliography of a new edition can provide guidance on material that should be part of the holdings of the library. Cui (1999), for example, noted that "citation analysis, the practice of counting citations to determine the scholarly impact of a work, is a method long used by librarians as an important tool of collection development" (para. 4). Both of these issues affect other academic considerations. As an indicator of how long this problem has been around, Bland (1980) noted that the need to determine what to buy "arises in connection with official accreditation visits, planning for new programs and courses, and as part of the effort to keep subject collections relevant to the users they are intended to serve" (pp. 195-196). Although standard lists exist of what material should be held by a library, Bland concludes that "textbook citations can provide a list of materials which goes far beyond the standard materials included in basic checklists" (p. 195). Ching and Chennupati (2002) also note that citation analysis could be used for fields where standard lists do not exist.

Citation analysis has other potential uses that affect institutions. Ching and Chennupati (2002) point out that citation analysis could be used to allocate resources at an educational institution, e.g., internal grants. West and McIlwaine (2002) claim that "in the United Kingdom and elsewhere, funding for universities is influenced by the number of publications that staff have had published in high-quality peer-reviewed journals and impact factors are a key index used in the judgment. Therefore, citation counts affect university funding" (p. 502).

Publisher Issues

Just as faculty members in some states must indicate how a new edition of a textbook differs from an earlier one, publishers are similarly required to provide this information although to a greater extent. Although federal law does not require faculty members to certify or acknowledge changes in new edition, federal law does require publishers to do so. In addition, the same state laws that require faculty members to certify or acknowledge changes in a new edition also require publishers to provide the same information.

Federal law on the issue originated in section 133 of the Higher Education Opportunity Act (HEOA) of 2010 and is codified in the U.S. Code. Section 1015 states that publishers must provide "a description of the substantial content revisions made between the current edition of the college textbook or supplemental material and the previous edition, if any." "Substantial content revisions" are defined as "new chapters, new material covering additional eras of time, new themes, or new subject matter." State laws mimic this language.

Statement of the Problem

The problem addressed by this research is that resources that compile bibliographies of introductory public speaking textbooks are inadequate. This lack of data hinders the ability of faculty, librarians, and researchers to evaluate various editions of textbooks. As a result, faculty may select textbooks for a course that are more expensive but little different from previous editions, librarians may acquire books for a school's collection that are not worth the expense, and scholars will be limited in the ability to conduct bibliometric research in this area. Better data can be used to answer a variety of bibliometric questions such as how the type, number, and

age of references change from edition to edition.

Studies of introductory textbooks in various subject areas would provide support for the creation of a resource that compiled the bibliographies of these textbooks. Introductory public speaking textbooks would offer one such subject area to study. Unfortunately no bibliometric research has been conducted on introductory public speaking textbooks and relatively little on textbooks. Typical research that examines the bibliographies of a textbook deals with the adequacy of the bibliography in general and subjective terms. This research, then, compiles and analyzes bibliometric data on one subject area of an introductory higher education textbook -- introductory higher education public speaking textbooks.

Research Questions

1. To what extent does change occur in the number of references used in subsequent editions of United States, national edition, introductory, college, public speaking textbooks?
2. To what extent does change occur in the average age (mean and median) of references used in subsequent editions of United States, national edition, introductory, college, public speaking textbooks?
3. To what extent does change occur in the type of reference used in subsequent editions of United States, national edition, introductory, college, public speaking textbooks?

Purpose

The purpose of this study is to measure changes in the bibliographies of successive editions of United States national edition, introductory college public speaking textbooks.

Changes are examined in the number, type, and average age of the references. This study is descriptive in nature rather than an attempt to test a hypothesis.

Organization of the Study

In the following chapters, relevant literature is reviewed, the research design described, results presented, and discussion of the results provided. The review of the literature in Chapter 2 covers the analysis of textbooks by examining the content, exploring the writing style, and conducting a bibliometric review. The bibliometric review presents arguments regarding the relationship between the quality of a work and the number, age, or type of reference. The coverage of the research design in Chapter 3 describes the rational for a bibliometric approach, the nature of the population involved in the study, the description of the sample, a listing of variables, procedures used to collect data, and the process followed to detect errors in the data. Chapter 4 presents the results of analyses using both summary data and raw data. The data are combined in several ways to account for multiple possible classifications of the data. Various fit lines (linear, quadratic, and cubic) are applied to scatter plots of data. In Chapter 5, the chapter covering the discussion and conclusions of the research, multiple topics are covered including an overview of the findings, implications for previous research, implications for practice, future research suggestions, and limitations of the study.

CHAPTER 2

LITERATURE REVIEW

An introductory public speaking textbook may be evaluated multiple ways, especially if considering it for use in a course. Some of the methods, such as the price of the book, customizability of the book (e.g., Sass, 2009), the quality of technology supplements (e.g., Sellnow, Child, & Ahfeldt, 2005), or the helpfulness of the book representative, are not germane to the focus of this research. On the other hand, what is covered in the book and how it is covered are issues of interest.

Instructors do not necessarily rely on extensive information to select a textbook. In fact, Young (1990) stated that "the most widely used criteria for selecting textbooks are copyright date and authors' credentials" (p. 84). Similarly, Westbury (1990) indicates that adoption decisions are "all too often made using what are, at bottom, superficial criteria" (p. 14). For instructors or book selection committees that do undertake a more detailed analysis of a textbook, the analysis might consist of evaluating the content, the readability, or the bibliography of the book.

Content Analyses of Textbooks

Historically, reviews of textbooks focus on a single or a select few books and provide a holistic evaluation of the book(s) (e.g., Chapin, 1950; Mouat, 1949) although there are a few recent examples of such reviews (e.g., Gutgold, 2002). These reviews tend to be short and often

provide only a personal opinion of a book. As a result, although these reviews were frequent 50 years ago, they have been replaced by more data-driven or systematic analyses.

Some recent research investigates features of introductory public speaking textbooks but only provides evidence of the features in general, not for each textbook. For example, the analysis by Bryant, Gula, and Zillmann (1980) examined the use of humor in public speaking, interpersonal, and mass communication books but did not provide data on individual textbooks. As another example, Hess and Pearson (1992) identified common topics and principles covered in twelve popular public speaking textbooks but did not break the data down by individual textbooks.

Other contemporary reviews of introductory public speaking textbooks examine a larger number of books and provide assessments of each one using more measurable criteria. Typically the review would argue, based on research and theory, how a specific topic should be covered, followed by an examination of how well various textbooks meet this ideal. Some of these reviews focused on how well textbooks covered topics such as civic responsibility (Fisher, 2003; Fisher, 2010; Persi & Denman, 1997), civility (Rood, 2013), conflict (Doolittle, 1977), critical thinking (Olsen & Bollinger, 1999), deception theory (Fiordo, 2010), diversity (Berens & Nance, 1991; Gulicks, Pearson, Child, & Schwab, 2005; Hanson, 1999; Yook, 1999), epideictic speaking (Horne & Mullins, 1997), ethics (Pearson, Child, Mattern, & Kahl, 2006), gender sensitivity (Hanson, 1999), information retrieval technology systems (Child, Pearson, & Amundson, 2007; Sullivan, 1989), intrapersonal communication (Nelson & Pearson, 1982), library research (Sullivan, 1989), listening (Adams & Cox, 2010; Janusik & Wolvin, 2002), oral citations (Kinnick & Holler, 2012), persuasive theory (Allen, 1997; Allen & Preiss,

1990), questioning (Olsen & Bollinger, 1999), rhetorical invention (McGarrity & Crosby, 2012), or speech apprehension (Clevenger & Phifer, 1959; Hinchcliff-Pelias, 1989; Pearson, DeWitt, Child, Kahl, & Dandamundi, 2007). Other reviews evaluated issues such as the need for a textbook (Cole, 1999; Rubin, 1999), the overall approach of the books (Fisher, 1970; Frobish, 2000; Hess, 1999; Russ & McClish, 1999; Slagell, 1999; Worley, 1999), the cultural bias of the books (MacLennan, 2000), customizability of the books (Sass, 2009), or the quality of the technology supplements (Sellnow, Child, & Ahfeldt, 2005).

Although these reviews may provide a starting point for selecting a textbook, they have limitations in helping to assess a new edition. First, the research may not apply to the new edition since authors and publishers may take the research into account when developing it. Although it may be easy to assess this with the textbook that an instructor is currently using, such an evaluation would require more effort when evaluating other available textbooks in the same way without replicating the original research. Second, compounding this limitation is that not all the research was done at the same time so the issue of it being outdated is amplified. Third, to date, the research has not evaluated all aspects of the textbook. In terms of content, no research was found evaluating the treatment by public speaking textbooks of the communication model, organizational patterns, language, topic selection, audience analysis, visual aids, introductions and conclusions, or verbal and nonverbal delivery. Additional areas to explore can be found in the work by McGarrity (2010). This may be unnecessary given the comments of Kulm, Roseman, and Treistman (1999) that an evaluation of middle school math textbooks “did indeed find that by studying a material's treatment of a small set of learning goals, the strengths and weaknesses of the material's instructional design and support can be identified” (para. 7).

Despite the limitations of reviews of the content of textbooks, these reviews could be useful in a bibliometric analysis of the textbooks. These reviews represent the latest research as it applies to introductory public speaking textbooks and should be cited in the bibliographies of the textbooks. The lack of such a citation would suggest the textbook is not up-to-date, especially if the research is found in other textbooks. Bibliometric analysis is discussed in more detail later in this review of the literature.

Writing Analyses of Textbooks

Some research studied the writing style of various textbooks. This research looked at how readable the books were (Schneider, 1991; Schneider, 1992; Schneider, 2011; Schneider & Walter-Reed, 2009) or the use of passive "to be" verbs in the books (Gruner, 1993). There is still some debate over what the reading level of a textbook should be or what the writing style should be so there is room for more subjective judgment about how to use this research.

One use of research on content as well as writing is the guidance it might provide for this research's method. Appendix 1 shows which editions are cited by various researchers. This provides a starting point for finding texts and suggests books that, if also included in this study, could be part of a future analysis comparing different aspects of the books. A second use of content and writing research on public speaking textbooks is to provide guidance on common methodological practices used to select textbooks. Table 1 provides a listing of twelve criteria mentioned by researchers when selecting public speaking textbooks for their research. Unfortunately, an examination of the table leads to the observation that only one researcher examining introductory public speaking textbooks randomly selected the sample used in the study. Studies such as this one, then, contribute greater rigor to the field.

Bibliometric Analyses of Textbooks

A bibliometric analysis evaluates a textbook by studying one of the inputs into the production of the book (information from other sources) and examining how the output is used by other researchers to produce their own output. Bibliometrics involves applying statistical tools to the bibliography of a publication. These tools can be as simple as counts of items in the bibliography or average age of the bibliography. They can also be more complex such as an examination of who cited the publication or how many other people cited the same sources as the publication did and benchmarking these data against the same statistics for similar publications.

Unfortunately this researcher found no bibliometric research has been conducted on introductory public speaking textbooks and relatively little on textbooks. Typical research that examines the bibliographies of a textbook deals with the adequacy of the bibliography in general and subjective terms. Instead, most bibliometric research focuses on an analysis of references in scholarly journals. This research examines how often a particular journal article is cited in other journal articles or how often a particular journal as a whole is cited. Nevertheless, some parallels or analogies can be identified between research on citing behavior in scholarly journals and citing behavior in textbooks. These comparisons can be applied to a bibliometric analysis of the number of sources used, the age of the sources, and the types of sources used.

From a theoretical perspective, the sources cited by an author are a communication to readers about what the author knows. According to Costas, Van Leeuwen, and Bordons (2012):

> References used by scientists indicate their conceptual framework, their influences, and knowledge they manage about their respective fields of work. From this point of view, longer reference lists in the oeuvres of researchers might suggest a broader knowledge of the field and a firm grounding in the preexisting literature. (p. 2434)

Table 1

Criteria Used by Researchers to Select Introductory Communication Textbooks

	Method											
Author(s)	National Edition	Random	Comprehensive	Popularity	Depth	Variety of Viewpoints	Minimum Content	Available	Typical	In Print	Number of Editions	Expert Author
Adams & Cox (2010)				X	X	X	X	X				
Allen & Preiss (1990)						X	X	X				
Bryant, Gula, & Zillmann (1980)		X	X							X		
Cawyer et al. (1994)				X								
Child, Pearson, & Amundson (2007)				X								
Fiordo (2010)**				X				X	X	X		
Gullicks, Pearson, Child, & Schwab (2005)				X			X					
Hanson (1999)****						X	X	X				
Hinchcliff-Pelias (1989)***						X		X		X	X	
McGarrity (2005)*				X								
McGarrity, & Crosby (2012)				X							X	X
Nelson & Pearson (1982)*****												
Pearson, Child, Mattern, & Kahl (2006)				X		X					X	
Pearson, DeWitt, Child, Kohl, & Dandamudi (2007)				X								
Schneider (1992)				X				X				
Schneider (2011)	X			X						X		

*In the case of McGarrity's (2005) research, "popularity" constituted the fact that the book was in use at the universities studied, although the listing of some of the books as being identified in a survey of widely used books was also mentioned.

**Specifically indicated a comprehensive list was not attempted.

***12 books selected randomly, 13 were not.

****Hanson (1999) specifically indicated the source of available books, i.e., those marketed at the 1997 National Communication Association conference. The books used by Hanson were also based on updated editions of those used by Allen & Preiss (1990) so the criteria used by them are inferred to also apply.

*****

*****Unknown source of books.

Even more than this informative function, Gilbert (1977), as well as Latour and Woolgar (1979), claimed decades ago that references are persuasive tools used to convince readers of the soundness of the publication's argument.

Arguments to the contrary exist. Assuming that the references in a publication can be used to measure quality is problematic, especially in an introductory textbook in higher education. First, a wide range of materials are referenced in introductory textbooks such as journals, books, the source of photographs, addresses of places to contact, song lyrics, advertisements, interviews, etc. There is variability in in the credibility of these sources. Second, measures of quality tend to be holistic and do not indicate what part of the publication exhibits the quality. For example, in a study of general surgical journals, Reddy, Srinivas, Sabanayagam, and Balasubramanian (2008) found the number of references in an article was not correlated to error rates in the accuracy of references but was significantly correlated with errors in quotations. Wang, Bendle, Mai, and Cotte (2015) reported that, for articles in the *Journal of Consumer Research*, methodological and consumer culture articles tended to be more heavily cited than other articles. These findings indicate that the citations to an article may be based on the methodology used or the subject of the article rather than the quality of the entire article. Third, publications may be cited for many motives other that quality. The seminal statement on this point was made by Garfield (1965) who listed numerous reasons why references are provided in papers, including:

1. Paying homage to pioneers
2. Giving credit for related work (homage to peers)
3. Identifying methodology, equipment, etc.
4. Providing background reading
5. Correction of one's own work

6. Correcting the work of others
7. Criticizing previous work
8. Substantiating claims
9. Alerting to forthcoming work
10. Providing leads to poorly disseminated, poorly indexed, or uncited work
11. Authenticating data and classes of fact – physical constants, etc.
12. Identifying original publications in which an idea or concept was discussed.
13. Identifying original publication or other work describing an eponymic concept or term as, e.g., Hodgkin's disease, Pareto's Law, Friedle-Crafts Reaction, etc.
14. Disclaiming the work or ideas of others (negative claims)
15. Disputing priority claims of others (negative homage). (p. 189)

Since Garfield, numerous other lists have been developed. In 1998, Baldi identified ten different classification schemes with "anywhere from 4 to 29 categories" (p. 831). In a specific article on the citation behavior of introductory public speaking texts, Frobish (2000) argues that Stephen Lucas cites references on narration yet "pays lip service to the narrative approach in his text" as do other authors (p. 247).

Based on the argument that references are persuasive tools, a variety of characteristics of a reference list can be examined for persuasiveness. First, authors who reference more sources may be signaling that their work is of higher quality. Second, the average age of references could have a persuasive effect. A reference list consisting of recent material could indicate that research is up-to-date. On the other hand, a reference list with a wide range in the age of materials could indicate the research is comprehensive. Such a reference list might also contain more references which would reflect the first point. Third, the type of material that is referenced can reflect the quality of a publication. Scholars, editors, publishers, and the public, among others, may attribute different degrees of credibility to books, journals, magazines, government documents, dissertations, interviews, and other sources of information. The next sections review the literature on the connections between quality and the number, age, and type of references.

The Number of References as a Quality Measure

Several studies support the argument that the number of references used by a source is a measure of quality. These studies found a relationship between the number of sources used in a publication and the quality of the work as measured in a variety of ways. One quality measure is the amount of experience the author possesses. More experienced authors are assumed to produce better quality research. Experience may involve the educational level or years in the field of the author. A second quality measure involves an evaluation by experts. In examinations of student papers, a teacher is operationalized as the expert. In the case of academic publications, peer experts are used. These first two quality measures may overlap. A third quality measure assumes that popular papers are also better in quality. This quality measure compares highly cited and poorly cited works, highly cited and poorly cited authors, and highly cited and poorly cited journals. Finally, there are miscellaneous proxies. For example, one author argues that lead articles in a peer-reviewed journal are higher quality than other articles in a particular issue.

References in Student Writings

A direct assessment of the quality of a work occurs when student papers are graded. For example, Gadd, Baldwin, and Norris (2010) found a positive correlation between the number of references that civil and building engineering undergraduate students used in their final projects and the final grade the students received. Carlson (2006) found such a positive relationship between undergraduate class year and the number of citations used in student research papers. Gao, Yu, and Webster (2007) found that doctoral students cited far more sources in their dissertations than students pursuing their master's degrees cited in their theses. Limitations to

these studies include that the criteria for evaluating student papers, especially undergraduate papers, may not be as rigorous as that used to evaluate published works, may not include the requirement that the work provide new knowledge, or may judge the papers on a basis not used for academic works. Another limitation is that the studies do not provide information about whether instructors restricted the number of pages that could be devoted to the bibliography. A textbook author, on the other hand, faces pressures from a publisher to limit the size of the book and the reference list might be an obvious place to economize.

References by Top Researchers

Peters and Van Raan (1994) concluded that the references of top scientists in chemical engineering were more numerous than the number of references used by "average scientists." On the other hand, a study of highly cited papers in Malaysia found that an increase in the number of references led to a slight increase in the number of citations but the increase was not statistically significant (Ale Ebrahim, Ebrahimian, Mousavi, Tahriri, 2015).

References in Articles Receiving Prizes

Coupé (2013) analyzed articles in economics and finance journals that received a prize as the best article published in the journal in a given year. The number of citations these articles received was compared to the number of citations that the runner-up article received as well as to the number of citations that other papers received. Top papers were seldom cited more than the runner-up paper although they typically received more citations than the median paper. Although this research did not assess how many references the different articles used, it does indicate the difficulty in establishing a simple linear relationship linking quality to citations to an article.

References and Reviewer Assessments

In order for a paper to get published or accepted at a conference, it generally must be reviewed by several people. To assess whether there was a relationship between the ratings of papers and the number of references in a paper, Connolly, Miller, and Friedman (2014) examined 154 papers submitted between 2007 and 2012 to ACM SIGITE annual conferences. They found a significant relationship ($p = .001$, $r = .270$) between the number of references and the score awarded each paper on a six point rating scale by the reviewer.

The same study (Connolly, Miller, & Friedman, 2014) found no significant relationship between viewer ratings and number of downloads, or number of Google Scholar citations. These findings contradict the findings about the relationship between the number of references and reviewer assessments, especially given the argument that number of citations to an article is a quality measure, so it seems either these other indicators are flawed or the use of citations as a measure of quality is flawed.

References in Articles in Top Scholarly Journals

Top scholarly journals may be assumed to have better quality articles due to their prestige which, may be due to publishing the top articles in the field. It may be possible to escape this circular argument if perhaps the prestige resulted from initially being the only journal in the field, or efforts by a particularly influential editor. However the cycle occurred, such scholarly journals are likely to receive more submissions, allowing editors to choose the best of the best. Costas, Van Leeuwen, and Bordons (2012) found that as the impact of a journal increased, the number of references per document increased. Gorman (2005) disputes the validity of this

research with a litany of criticisms for using journal impact factors to measure quality. First, he notes that a great deal of variance can occur in the number of citations individual articles accrue in a journal due to the nature of the article. Review articles and longer articles, for example, receive more citations than other articles and, of course, poor quality articles are assumed to receive fewer citations than high quality articles. Second, the database used to create journal impact scores is not complete since it does not include all journals, is deficient in the coverage of books, and includes data to "non-citable" items. Third, journal impact scores can only be used to compare journals in the same field since some fields are larger than others, and are growing or falling into obsolescence faster than others. Finally, publication practices of the journal affect impact ratings. Since ratings are based on the average number of citations to articles in the journal over the last two years, short publication lags can result in a journal publishing articles with greater current interest. These articles get cited more because they report on a subject before other journals with longer publication lags publish similar and possibly better quality research articles.

References in Highly and Poorly Cited Works

A commonly studied indicator of quality is the number of citations that a work receives. Several studies have found a relationship between the number of citations a work receives and the number of references in the work. A study of highly and poorly cited medical articles in the medical journal *Lancet* found a "fifty to six hundred percent greater median number of references" in highly cited articles (Kostoff, 2007, p. 519). Uzun (2006) examined 467 articles published in the international journal *Scientometrics* from 1999 to 2003 and found that the number of references in an article, adjusted for growth in the number of references over time,

was significantly related to the number of citations the article received. This relationship was linearly associated with a correlation coefficient, $r = 0.799$. Webster, Jonason, and Schember (2009) examined 562 articles in the journal *Evolution and Human Behavior* and found that articles that cited more references were in turn cited more themselves, explaining 19% of the variance in citations. In his invited talk at the 2010 3rd biannual conference of the International Society for the Psychology of Science and Technology, Gregory D. Webster examined all 53,894 articles published in the journal *Science* between 1901 and 2000 and found "almost half of the variation in citation rates among the *Science* papers can be attributed to the number of references that they include" (Corbyn, 2010, para. 7). Haslam and Koval (2010) found in their study of social and personality psychology journals that the number of references was related to the number of citations received although the quality of the journal was a more important factor. Similarly, Lovaglia (1991) found that, regardless of the length of the article, the number of references in articles in sociology journals was positively correlated with the article's subsequent ability to gather citations, although this relationship only held true as long as the number of references was 66 or less. This ideal represented a number 20% greater than the mean number for all articles. Numerous other studies examining different subject fields, using different methodologies and controlling for a mixture of variables support the general conclusion that articles with more references are cited more (Biglu, 2008; Didegah & Thelwall, 2013a; Haslam et al, 2008; Lokker, McKibbon, McKinlay, Wilczynski, & Haynes, 2008; Moed, Burger, Frankford, & van Raan, 1985; Peters & van Raan, 1994; Stewart, 1983; Vieira & Gomes, 2010; Walters, 2006).

Some conflicting studies exist. A study of highly cited papers in Malaysia found that an increase in the number of references led to a slight increase in the number of citations but the increase was not statistically significant (Ale Ebrahim, Ebrahimian, Mousavi, & Tahriri, 2015). Although the study did not find a statistically significant result, the trend is consistent with studies supporting a relationship between the number of references and the number of citations to the article with the references.

A premise exists that many references indicate high quality, and other authors will cite the work because of this perceived quality. One argument supporting the claim that references are a measure of quality involves the relationship between citations to an article and the number of downloads of the article. Downloads indicate an interest in the article and a preliminary assessment of usefulness or quality given that the title, abstract or entire article might be read before the download occurs. An extensive list of studies have thus found a relationship between the number of downloads of a paper and the number of citations it receives (Antelman, 2004; Guerrero-Bote & Moya-Anegón, 2014; Harnad & Brody, 2004; Lawrence, 2001; Metcalfe, 2005; Metcalfe, 2006; Moed, 2005; Moed & Halevi, 2016; O'Leary, 2008a, 2008b; Schwarz & Kennicutt, 2004; Xue-li, Hong-ling, & Mei-ying, 2011).

In contrast, a study by Davis (2011) compared 712 articles randomly made available for downloading for free with 2,533 control articles available only by subscription and found no increase in the number of citations to the open access articles within the first three years of availability. The articles came from 36 academic journals covering the biological, medical, and multidisciplinary sciences, social sciences, and humanities. In an earlier article, Davis, Lewenstein, Simon, Booth, and Connolly (2008) provide an explanation for this finding by

noting “some argue that open access articles are cited more because authors selectively choose articles to promote freely, or because highly cited authors disproportionately choose open access options.” Additionally, “self-archiving an accepted manuscript in a subject-based digital repository may provide additional time for these articles to be read and cited” (p. 1). Another explanation provided by Davis (2011) is that researchers likely to cite an article have easy access to journals without the need for open access availability. Finally, it may be that if downloaded articles are cited more, it is because of easier access to the article, not due to its quality.

Two competing explanations may be offered for why the number of citations is not linked to indicators of quality. First, a linking explanation argues citations create a link to other articles so citing more articles increases the visibility of an article for researchers using citation indexes or bibliographies to find relevant research. Moed (2005) found a similar effect between downloads of documents and the number of citations to the document that, when controlled, reduced the correlation between the two from .35 to .11. This indicates a linking effect exists but does not fully eliminate the relationship. Second, a reciprocity explanation argues that authors cite others in the expectation that others will cite the authors. In an invited talk given at the 2010 3rd biannual conference of the International Society for the Psychology of Science and Technology, Gregory D. Webster presented a citation analysis of 100 years of articles in the journal *Science* and indicated that the relationship between the number of references in an article and the number of citations the article receives may be due to scientists behaving in an almost tit-for-tat way or in a way that is based on reciprocal altruism (Corbyn, 2010).

A more serious difficulty with research comparing the number of references in an article and the number of citations it receives involves the large number of confounding variables that

must be addressed. Bornmann and Daniel (2008) listed six categories of confounding variables in their literature review on the subject. First, time acts as a confounding variable. Over time an exponential increase in the number of publications has occurred which increases the number of citations available to any individual piece of research. As indicated earlier, citations tend to produce other citations due to the citation getting published in citation indexes and due to researchers using citations in a bibliography to assist with their research. Second, the field in which an article is written serves as a confounding variable. The size of a field, and citing customs in the field vary making comparisons between fields or subfields difficult. An article by Hyland (1999) of 80 research articles in top journals of 7 disciplines, for example, found that the number of citations in disciplines ranged from a low of 7.3 per 1000 words for Mechanical Engineering to 15.5 per 1000 words for Molecular Biology with "softer disciplines" (Sociology, Marketing, Applied Linguistics, Philosophy) tending to cite more sources than Engineering and Physics (p. 346). Third, journal characteristics produce confounding effects. The frequency of publication, the order of articles in a publication, the availability of the publication, and its impact have all been shown to affect citations. Fourth, article characteristics are a confounding variable. Whether the article is original research, a review article, a methodological piece, a letter, or a note affects the number of citations. The number of co-authors and the length of the article also affect the number of citations to the article. Fifth, there are author/reader dependent factors that can confound an analysis. Research has found that the number of citations to an article is affected by the language of the authors, the language of the readers, and the gender of the authors. Finally, there are technical issues that can confound a citation analysis. Errors exist in publications listing citations, and some articles are not included in citation indexes.

References in Lead Articles

As another indicator that the number of citations used in a work is a measure of quality, Lovaglia (1991) argued that journal editors pick the best (or most popular) articles and put them in the first position in the journal. He continued by arguing that these articles also had more citations. This reasoning first requires proof of several points: that editors can pick the best article, that the best article is placed in the lead position, that articles in this position have more references, and that these articles also receive more citations.

The first assumption is that journal editors can determine the quality of an article. Zsindely and Schubert (1990) raise some doubt along this line based on their finding that editors-in-chief of medical journals were cited significantly less than the average author who published in the edited journal. From this, they concluded that the "editors-in-chief are not necessarily experts (in the sense of a higher-than-average citation rate)" (p. 251). In addition, Laband and Piette (1994) argue that editors may show favoritism or use connections in order to convince authors to submit the article to their journal. However, Laband and Piette found that this favoritism resulted in the submission of higher quality articles. They found a significant relationship (at the .01 level of significance) between an author having a personal tie to an editor and the number of citations to the author's article. Therefore, even if an editor is not an expert, he or she may still end up soliciting articles of higher quality and putting them into places of prestige due to favoritism. In fact, Laband and Piette found twice as many citations were made to the lead article when the author had a connection to the editor even though only 25% of the authors had such a connection. When differences in author, article, and journal-specific characteristics were controlled, papers written by authors with connections to the editors

received 29% more citations on average. Nevertheless, poor quality papers were also selected by the editor as the study found "over two thirds of the papers with residual citations at least one standard deviation below their predicted values were published by editors" who had a connection to the authors (p. 201). On the other hand, Ayres and Vars (2000) found no statistically significant indicator of favoritism in law review articles.

Regardless of arguments about the ability of editors to pick quality papers, lead papers do receive more citations. Hudson (2007) found lead papers received significantly more citations than those in other positions at a 5% level of significance. The same level of significance was found for this relationship by Laband and Piette (1994) and Smart and Waldfogel (1996). Ayres and Vars (2000) found that the first piece in law reviews "received 108 percent more citations than pieces appearing fourth or later ($p = .013$)" and that appearing second in an issue "was a marginally significant advantage ($p = .087$)" (p. 437). Borokhovich, Bricker, and Simkins (2000) show that lead articles in the *Journal of Finance* and *the Journal of Financial Economics* are cited more frequently than other articles.

Increased citation of lead articles is due to the quality of the paper, although some of these increased citations are because the article is in that position. Perhaps the most persuasive study on this issue was authored by Coupé, Ginsburgh, and Noury (2010). They examined articles in the *European Economic Review* during a time period in which some issues arranged articles alphabetically in the journal and in which the order of some issues was determined by the editor. They concluded that "approximately two thirds of the additional cites that leading papers get seem to be due to the effect of going first, while only one third can be considered a genuine quality effect of the editors' discretionary choice" (p. 6). The research by Pinkowitz (2002) is

equally compelling since it found that “lead articles are downloaded significantly more often than other papers both before and after being named the lead article” (p. 487).

The final link in the argument chain is whether lead articles have more citations. Lovaglia (1991) found that articles in the first position had more references than articles in subsequent positions, in many cases significantly more references depending on the journal and which positions were compared.

Perceptions of References in Textbooks

Collisson, Kellogg and Rusbasan (2015) examined the effect of different amounts of references (none, normal, excessive) on people’s perceptions of the scientific nature of psychology. They found that a significant decrease in the perception of psychology as a science occurred when no citations were included in a sample section of an introductory psychology textbook as compared to including twice as many citations as the normal textbook used. This effect did not exist with biology textbooks, however. The explanation provided was that biology is considered a hard science whereas psychology is not perceived in comparable terms; thus, psychology must justify its claims with more citations.

Taken together, the theory and the research suggest a connection between the number of citations and the quality of a publication. Although citations may be based on popularity, part of the popularity would seem to be based on the quality of the publication. In addition, there is consistency in the findings using multiple measures of quality that support a positive relationship between the two variables. Nevertheless, the dissenting studies indicate that there are multiple variables affecting any relationship.

Missing from this research is a benchmark for introductory public speaking textbooks. Unless the research is done specifically on this type of literature, it is unlikely previous research can provide a benchmark for how many references are ideal since different fields have different standards and these standards change over time. As Frandsen and Nicolaisen (2012) noted after their review of the literature, the number of references cited by authors "varies substantially from one discipline to another" (p. 65). Adair and Vohra (2003) found "counts of references within sampled empirical journal articles in sociology, physics, biology, and experimental and social psychology revealed impacts of the knowledge explosion in all disciplines but the greatest effects within psychology " (p. 18). Coffman (1985) found that the average number of citations in 174 articles in *The Dictionary of the History of Ideas* varied between those in the fields of Literature and Arts, History, and Philosophy and Religion with articles in the field of Literature and Arts containing about 26 citations per article, those in History having about 32 citations per article, and those in Philosophy and Religion including about 23 citations per article on average. In addition, Coffman found that there was variability in the average age of citations for different types of references, indicating interaction effects. Chun (1999) found variations at even finer levels in concluding that differences in the number of citations in Korean Studies journals occurred based on the subject of the article and the journal that published the article as well as the sub-discipline. Not only does the number of citations in a publication vary by discipline but it also varies over time. In examining publications covered by the Science Citation Index (SCI) and the Web of Science, Biglu (2008) found "the number of references per paper from 1970 to 2005 has steadily increased. It increased from 8.40 in 1970 to 34.63 in 2005, an increase of more than 4 times" (p. 453).

References in More Readable Material

Besides the content of an article, its readability is another measure of quality. The assumption is that if authors cite more articles, they may have a better grasp of the topic, may be able to make a more persuasive argument, or may be able to pull upon a greater repertoire of phrasing that would affect the readability of the material. Research bordering on addressing this argument has looked at both full journal articles as well as abstracts of articles to determine if there is a relationship between readability measures and the number of citations received (e.g., Armstrong, 1980; Connolly, Miller, & Friedman, 2014; Didegah & Thelwall, 2013b; Dolnicar & Chapple, 2015; Gazni, 2011; Hartley & Benjamin, 1998; Hartley, Sotto, & Pennebaker, 2002; Hartley & Sydes, 1997; Hartley & Trueman, 1992; Lei & Yan, 2016; Sawyer, Laran, & Xu, 2008; Stremersch, Verniers, & Verhoef, 2007; Zimmerman, 1989). Generally, there is no consensus in the research of a relationship between readability and the number of citations received. In addition, research has not yet connected readability to the number of references in an article.

Interestingly, several studies have assessed the readability of a sample of public speaking textbooks at different time periods (Schneider, 1991; Schneider, 1992; Schneider, 2011; Schneider & Walter-Reed, 2009). These textbooks are part of the data set for this research which includes information on the number of citations for various editions, perhaps leading to an answer to whether there is a relationship between the number of references and readability measures.

Even if researchers studied the connection between readability and the number of references in an article, these studies would face serious conceptual problems. As Didegah and

Thelwall (2013b) write:

> All readability measures have two common limitations: first, they do not consider the characteristics of readers. The readers of scientific papers are experts in their own fields and have prior knowledge and interest in them; second, they fail to consider the characteristics of the text affecting text comprehension such as content familiarity, text structure, and author style. (p. 871)

Thus, while there is evidence regarding the link between readability and quality, the second part of the link - the link between number of references and readability – is missing.

The Average Age of References as a Quality Measure

Compared to the previous indicator of quality, the argument that the average age of the references used in a textbook reflects the quality of the book is easier to understand. One explanation is that older research does not benefit from the latest advancements in knowledge whereas the most recent publications can take full advantage of this information. For example, Westbury (1990) argues that "texts should be up-to-date in 'content' or 'values,' so new editions and recent copyright dates are required to ensure that new understandings of subject matter and teaching processes are incorporated" (p. 14).

Factors affecting aging

A more complex exploration of the relationship between the average age of the references used in a textbook and the quality of the book recognizes that there are three general forces involved in this relationship. First, there are forces affecting the initial choice of references. Second, there are forces that make the literature obsolete. Third, even if the literature is not obsolete, there are forces involved in the aging of references in subsequent editions of a book.

Numerous forces affect the initial choice of references used in a book and these affect the average age of the references. Some of these forces also affect subsequent use of references. One force that affects how likely a reference will be cited involves the author's familiarity with the material. Authors are more likely to cite their own work (Lariviere, Sugimoto, & Bergeron, 2012), work authored by members of their peer group (Hirsh & Dinkelacker, 2004; White, 2001), and work they studied during graduate school versus work from other time periods (Barnett & Fink, 2008). In some cases, this familiarity results in works being cited soon after they are published but it also leads authors to continue citing the material for longer periods of time, reducing the average age in the former case and increasing the average age in the latter case. If material is not familiar to the author, a time lag can occur until the author is exposed to the information. Over 40 years ago, Doolittle (1977) suggested that in introductory communication textbooks, "a time lag of two years is typical" (p. 127). As a second force, the more limited the population of articles an author chooses from, the more likely the author is to miss the most up-to-date material.

If information is not obsolete, there is little reason to cite more recent repetitions of that knowledge. In fact, older material may be more valid since distortions can occur through secondary citation. Public speaking knowledge provides an example of this since much of the material taught in public speaking textbooks has not changed in 100 years (Berens and Nance, 1991; Gruner, 1993) and is consistently covered across textbooks (Soller, 1986). Examples from the Communication field of distortions in reporting original research include corrections to the claim that public speaking is the number one fear of Americans (Dwyer & Davidson, 2012) and that 93% of meaning is carried through nonverbal communication (Lapakko, 1997).

Line and Sandison (1974) listed four possible reasons for why literature may become obsolete. First, the information is valid but is incorporated into later works. Second, the information is valid and is superseded by later works. Third, the information is valid but the field is of declining interest. Fourth, the information is no longer valid. Price (1970) suggests a fifth reason that is similar to the first. He suggests that some literature becomes obsolete because the knowledge is taken for granted and the source of the knowledge is thus not cited any more.

Whether the information is obsolete or not, there are several forces involved in the age of material used in subsequent editions of a book. Coleman (2001) describes three of these forces as "conservational practices of writers, to persistent citation of the oldest literature, and to a systematically diminishing efficiency in replacing older references with more current ones" (p. 692).

First, when writing a new edition, authors engage in a conservation of effort by salvaging viable references but references that have aged. This behavior would also result in authors salvaging older references from similar works by other authors rather than starting fresh when initially writing a textbook. Coleman's idea of the principle of conservation is consistent with Zipf's (1949) principle of least effort which states that information seekers will use the easiest search methods available and stop searching as soon as minimally acceptable results are found.

Second, there is persistent citation to the oldest literature. Even if new material is added, material that is kept gets older, thus "continued citation of older literature will stretch out the lower tail of the distribution and, thereby increase the mean age of references in the distribution" (Coleman, 2001, p. 691).

Third, authors exhibit systematically diminishing efficiency in replacing older references with more current ones. Coleman (2001) found this to be true of the 89 textbooks he examined but he did not provide an explanation. One possible explanation, however, is that these older references were seminal works and were kept to provide an acknowledgement of that fact. Another possibility is that there was not a failure to replace older references but that older references were added due to a desire to reference seminal works.

Indicators that Recency is a Measure of Quality

The previous discussion provides some evidence that the use of more recent references is an indicator of quality. More specific evidence involves the behavior of scholars, patterns of citations, and number of citations to assess whether recency is an indicator of quality in a publication.

The behavior of scholars. The behavior of scholars tends to confirm the importance of up-to-date material since they tend to read current articles more frequently than older material (Tenopir, Volentine, & King, 2012). Supporting this point is the limited time scholars have to read material in general. Contributing to this preference is publishers who push recent material to scholars as opposed to older material. This push from publishers versus a pull from readers comes in the form of electronic table of contents (eToCs), RSS feeds, and Twitter posts (Newman & Sack, 2013).

Patterns of citation. Another confirming piece of evidence is that although a variety of patterns exist for how frequently academic information is cited over time, the most common patterns involve increasing patterns of citation after publication of the information followed by a declining curve (Wang, Ma, Chen, & Rao, 2012). This pattern indicates a period in which the

information is cited more frequently as researchers become aware of it, followed by obsolescence of the information as other research supplants it. Stewart (1983) indicates that "the peak in the average rate of citations occurs in about two or three years after publication, with rapid changes before and after this peak" (pp. 171-3).

Citations to works with more recent references. Just as works with more references were cited more frequently, so too are works with more recent references. Haslam et al (2008) found a significant correlation between the recency of references and the impact of an article ($r = .19$, $p < .01$). When a multivariate analysis was conducted using significant predictors from a univariate analysis, the recency of references was still a significant predictor ($r = .19$, $p < .001$).

Effects of publication delays. One argument made by researchers of bibliometrics is that certain papers receive more citations because they deal with a hot topic. The same paper published earlier or later than the period when a topic is hot may receive fewer citations as a result. In a study by Stewart (1983), the number of months between the acceptance date of a journal article and the publication date was used as an independent variable correlated with the number of citations as the dependent variable. The outcome was that as the delay increased, the number of citations decreased. This delay increases the age of the references, supporting the claim that currency in citations is a measure of quality as determined by the number of citations. Additionally, the results point out that the definition of quality includes the concept of relevancy.

Variations in Aging Patterns

Aging patterns of references are commonly measured by Price's Index which calculates the percentage of references that were published in the last ten years (Price, 1970). Where the literature in a field uses a larger percentage of recent material, Price refers to the field as being at

the research front and has what he calls an "Immediacy Effect." Data from several studies showing aging patterns are found in Table 2.

Publications in different disciplines have different aging patterns for cited literature. The aging pattern also differs by the type of material. In the Library and Information Science field, Mahapatra (2009) found nearly 40% of citations in journals were to articles 0-5 years old, 65% were 0-10 years old, and 80% were 0-15 years old. For books cited by Library and Information Science journals, 29% were 0-5 years old, 52% were 0-10 years old, and 69% were 0-15 years old. Ching and Chennupati (2002) found a different age distribution pattern in their research. They examined 35 teacher's guides in eight secondary school subjects published in 2000 and analyzed the 2,089 citations from these guides. Of these citations, 2% were 1-5 years old, 30% were 0-10 years old, 52% were 0-15 years old, 71% were 0-20 years old, 81% were 0-25 years old, 88% were 0-30 years old, and 94% were 0-35 years old. This remaining 6% of all citations are spread from 36-80 years old and no five-year period constituting more than 1% of the total. Chun's (1999) research based on 193 Korean Studies journal articles found a mean age of citations equal to 20.87 years with a median of 12 and Price's Index equal to 21.9%. In addition, 21.9% of citations were 0-5 years old, 42.4% were 0-10 years old, 56.3% were 0 to 15 years old, 66.6% were 0 to 20 years old, 73.6% were 0 to 25 years old, 77.9% were 0 to 30 years old, and 82.1% were 0 to 35 years old. Zafrunnisha and Pulla Reddy (2010) examined psychology Ph.D. theses completed between 1963 and 2005 from three universities in India for the age distribution of journals and books included in the reference list. Authors used more recently published journals compared to books and the difference in age between the two types of references increased for every five-year time period up to twenty years. For example, 14.3% of journals

Table 2

Age of References in Journals

Age	Ching & Chennupati (2002)	Chun (1999)	Coffman (1985)*	Mahapatra (2009) [references to books]	Mahapatra (2009) [references to journals]	Griggs, Proctor, & Cook (2004)	Zafrunnisha & Pulla Reddy (2010) [references to books]	Zafrunnisha & Pulla Reddy (2010) [references to journals]
0-5	2%	21.9%		29%	40%		14.3%	9.0%
0-10	30%	42.4%	20.7%	52%	65%	43.8%	34.8%	23.5%
0-15	52%	56.3%		69%	80%		54.7%	39.9%
0-20	71%	73.6%	37.4%			70.1%	69.8%	54.8%
0-25	81%	80.6%					78.3%	66.2%
0-30	88%	84.9%	46.1%			83.3%	86.9%	78.9%
0-35	94%	89.1%					91.5%	85.1%
0-40			53.2%			90.4%	94.4%	89.2%
0-45								
0-50			58.9%					

*Data for Coffman (1985) were calculated from two separate tables since age data was broken into 50 year intervals in one table and did not include data from citations before 1900 in a second table. In addition, the data for the 0-10 year age table is probably overestimated slightly since it includes citations from 1960 to the 1972 publication date of the book, a period of 12 years rather than 10.

were 0-5 years old while 9% of books fell into this time period. For references 0-10 years old, 34.8% of journals and 23.5% of books fit this category. For references 0-15 years old, 54.7% of journals and 39.9% of books were categorized this way.

More relevant to this research is the aging pattern of references in books, especially in subsequent editions of a book. Two studies, both dealing with introductory psychology books, were found in the review of the literature. The data from these studies are found in Table 3.

An excellent example of this research was conducted by Coleman (2001) using 89 psychology of learning textbooks dating from 1952 to 1995. Unfortunately data were only provided on the percent of references that were no more than five years old. For this time period, approximately 13% of references were five years old or less but this percent changed over time from 23.2% for books published 1952-1972 to 15.2% for books published 1973-1982 to 10.5% for books published 1983-1995.

A study by Griggs, Proctor, and Cook (2004) of 15 introductory psychology books published from 2000-2002 found 1.25% of citations were dated 2000 or more recently. Citations dated 1990-1999 (about 1-10 years old) comprised 43.76% of the total number of citations. Citations from 1980-1989 (about 11-20 years old) equaled 25.11% of the total. Citations from 1970-1979 (about 21-30 years old) amounted to 13.21% of the total. Citations from 1960-1969 (about 31-40 years old) added up to another 7.10% for a total of 90.43% of all citations.

Publication date as a confounding variable

One source of imprecision affecting research on the age distribution pattern of research involves the date of publication of an item. First, typically, only the year of publication is given. If, for example, a publication was issued on January 1, 2016 and a citation used in the

Table 3

Age of References in Introductory Psychology Books

Age	Coleman, Fanelli, and Gedeon (2000) [1952-72 books]	Coleman, Fanelli, and Gedeon (2000) [1973-1982 books]	Coleman, Fanelli, and Gedeon (2000) [1983-1995 books]	Griggs, Proctor, & Cook (2004)
0-5	23.2%	15.2%	10.5%	
0-10				43.8%
0-15				
0-20				70.1%
0-25				
0-30				83.3%
0-35				
0-40				90.4%

publication was dated December 31, 2015, only one day separates the two works but calculations based on only the year indicate a year between them. At the other extreme, if a publication was issued on December 31, 2016 and a citation used in the publication was dated January 1, 2016, almost a year separates them but calculations based on the year alone would indicate no difference in age. Thus, age calculations may be inaccurate by as much as plus or minus one year. A second problem is that an article may be released well before it is officially published. Pinkowitz (2002) noted that

> In the 25 months from November 1997 to November 1999, the *Journal of Finance* posted 202 articles and shorter papers for a total of 3,357 paper months. The papers were downloaded more than 284,000 times, averaging nearly 85 per paper, per month. Additionally, articles were available an average of 311 (median of 320) days prior to publication. (p. 486)

Thus, the date an article becomes available could be almost a year later than the date listed by data sources.

The Sources of Information as a Quality Measure

When writing, researchers can use several types of information. These types of information primarily include journals and books but also conference papers, dissertations and theses, magazines, newspapers, web sites, government documents, and interviews. Minor categories include speeches, movies, songs, poems, audio cassettes, survey responses, pamphlets, newsletters, unpublished works, advertisements, or television shows. Overlap can occur between categories such as when a speech is recorded on an audio cassette, a poem is found in a book, or a journal article is found on a web site. One way to identify these different methods is how style manuals differentiate how to cite each type of information.

Different disciplines and different types of publications have different conventions or customs as to the emphasis placed on different sources of information. This emphasis can be described in terms of the most important sources of information as well as in terms of the diversity of sources. Mahapatra (2009) notes that for journal articles "in science and technology, journals are cited more in number than any other document, which indicates that the scientists mostly depend on journal literature. But books are referred more in number than journals in the social science and humanities" (p. 28). Generally, scholarly journal articles are perceived as the most credible references because they are subjected to a more rigorous peer review process and are accessible by researchers. On the other hand, the *Publication Manual of the American Psychological Association* (2010) states that because personal communications "do not provide recoverable data," they "are not included in the reference list" (p. 179). The *Manual* continues by stating a caution about citing electronic communications such as emails, nonarchived discussion groups, or electronic bulletin boards because these are a "casual form of communicating." The most relevant research found involved a study by Gao (2015) on the type of references used by in journal articles and book chapters by Communication faculty at the University of Houston for the time period from 2006 to 2014. Out of 1689 references, Gao found that 59.4% were to journals, 29.6% to books, 4.7% to the web, 2.2% to magazines, 1.2% to conference papers, 1.0% to technical reports, and 1.9% to other material.

Closely related to Communication is Psychology. In a bibliometric analysis of psychology journal articles, Hooper, Wordofa, and Gibson (2017) found "scholarly journals account for over 80% of literature use, while books, in part or whole, account for about 17%, leaving less than 3% for proceedings, dissertations and theses, software, government/public

resources, working papers, websites, and other" (p. 275). There was variability in these results, depending on the subfield of Psychology and the related journal. For example, the *Journal of Educational Psychology* had the lowest percent of references to journals at 66.5% while *Bipolar Disorders* had the highest percent at 93.2%. For books, 5.3% of references in *Social Cognitive and Affective Neuroscience* were to this type of reference while, at the other extreme, 15.2% of references in the *Journal of Educational Psychology* were to books. The authors partially attributed the variability in the types of references used to the degree that a subfield was scientific.

In the field of Korean Studies, Chun (1999) examined 193 journal articles to provide an idea of benchmarks for that discipline. For the 20 year period from 1977 to 1996, monographs (books, collections of writings, and pamphlets) constituted 59% of citations, serials equaled 34.8% of citations, unpublished material added up to 4.7% of citations, and other material comprised the remaining 1.5%. In the category of serials, periodicals consisted of 24.3% of total citations, and newspapers 8.7%, with other serials equaling 1.8% of citations. Variations in the diversity of sources were also found across areas in the discipline.

In the field of International Relations, Zhang (2007) selected a random sample of 651 citations from a total of 29,862 citations in 410 research articles published in three high impact journals to assess the types of references used. The book category, which included book chapters, made up 48% of total citations while journals equaled 38%, government publications 5%, internet sources 2%, magazines 1%, newspapers 1%, and other categories 5%.

Within the field of International Relations, Zhang (2007) also found differences between qualitative and quantitative articles. For example, authors of qualitative research journal articles

cited books 57% of the time while authors of quantitative research only cited them 29% of the time. On the other hand, qualitative research articles cited journals 29% of the time while quantitative articles cited them 58% of the time, a nearly perfect reversal of the percentages.

Zhang's (2007) research was criticized by von Isenburg (2009) for a number of reasons. First, the study did not clearly state "how qualitative, quantitative and qualitative-quantitative methodologies were defined in the context of the study" (p. 54). Second, there are limitations associated with the data used. The use of Social Science Citation Index data is problematic because the Institute for Scientific Information "will strip out any data that would indicate that the source was electronic" and, adding to the problem, authors may not report that an internet source was used to access reference material (p. 54).

Not only are there indications that different fields have different patterns in what material is used but different types of publications may have different customs. In the case of a reference book, a bibliometric analysis of *The Dictionary of the History of Ideas*, Coffman (1985) may have identified an extreme pattern in the types of materials cited. For articles in the area of Literature and Arts, 77.5% of citations were monographs, 8.0 % were journals, and 14.0 % miscellaneous citations. In the area of History, 75.0 % were monographs, 10.0 % were journals, and 14.8% were miscellaneous citations. In the area of Philosophy and Religion, 86.0 % were monographs, 5.7% were journals, and 8.3% were miscellaneous citations.

In the case of dissertations, Tuñón and Brydges (2005) examined 10,023 citations from 143 applied doctoral dissertations from the Child and Youth Studies program at Nova Southeastern University and calculated that 68% were to periodicals, 19% to books, 5% to reports, and the remaining seven categories constituting the other 8%. Different results were

found by Beile, Boote, and Killingsworth (2003) who conducted an "analysis of 1,842 coded citations gleaned from 30 education dissertations awarded in 2000 from 3 institutions in the United States." The analysis "revealed that journal articles, at 45%, were cited most frequently, followed by monographs (33.9%) and 'other' (18.3%), with magazines and Web sites contributing less than 2% each of the total material types cited" (p. 1). In a subsequent article, however, their conclusion summed up the difficulty of reaching a conclusion in this area by stating that considerable variation exists in the type of material cited among the three institutions (Beile, Boote, & Killingsworth, 2004). The percentage of journals cited in dissertations ranged from 39.6% to 51.4%, the percentage of monographs cited varied from 26.0% to 43.8% and the percentage of other types of material ranged from 9.8% to 31.3%.

In the case of conference papers, a study by Wainer, De Oliveira, and Anido (2011) of all papers published by ACM in 2006, 40% of references were to conference papers, approximately 30% to journal articles, about 8% to books, and 10% to other types of documents. In an interesting refinement to the analysis, the authors also looked at the distribution in type of material for those documents referenced at least 10 times in the papers. The percentages were similar with 41% of references conference papers, 37% books, and 16% journal articles. This refinement may be useful in uncovering the primary works relied upon by a body of research.

Variables Affecting the Age, Number, and Type of References

Four variables were examined to determine their effect on the age, number, and type of references. These included the effect of the edition, the copyright year, the number of pages, and whether footnotes or a bibliography was used. Not all of these variables were investigated relative to the age, number, and type of references since some were unlikely to affect the age,

number or type of reference. The reasons for examining the edition, copyright year, number of pages, and whether footnotes or a bibliography was used are provided in the following section.

Effect of the Edition

In a study of multiple editions of introductory psychology textbooks, Coleman (2001) found authors exhibit systematically diminishing efficiency in replacing older references with more current ones. The lack of replacement would affect both the average age of references and the number of references in subsequent editions. For an introductory public speaking text, this effect should be even more pronounced since the basic material has not changed in 100 years (Gruner, 1993).

Each subsequent edition should also have more references. It takes little effort to leave a reference in a text and textbook authors are probably not bound by page limitations as much as authors for journal articles. The textbooks analyzed for this research includes books with the number of pages ranging from 475 to 741.

The type of references is likely to change from edition to edition. The introduction of the internet and electronic database search tools is a primary reason since they allow easier access to some materials that were hard to find previously. In addition, some types of materials did not exist before the internet (e.g., web pages, blogs, twitter posts, etc.) so that source should first appear over the course of editions studied in this research and the number of times it is reference should grow with the expansion of the internet.

Effect of the Year of Copyright

The growing speed and ubiquity of computers, the development of the internet, and the related growth of electronic databases makes more material available to researchers and makes the information easier to find. These factors mean that more recent editions of a textbook should have more citations and more up-to-date citations. The dividing time between manual searches and internet searches would be about the mid-1990s.

The copyright year might also affect the type of references. Certain types of references might not be as easy to find if a database did not exist for that type of information or if the information in the database was limited. For example, before 2005, there was no citation index for academic books. Since then, two references have been developed to provide this information: *The Book Citation Index* originally produced by Thomson Reuters and owned by Clarivate Analytics at the time of this writing, and *Google Books*. In 1999, NewspaperArchive.com was launched, providing greater access to newspapers.

There are also instances of changes in types of references not attributed to the internet but apparently related to the date of publication. For example, in the analysis of Korean Studies journals, Chun (1999) found "the use of periodicals decreased from 30.6% in 1977-81 to 19.1% in 1992-96" and citations to newspapers "sharply increased from well under 10% during the first three periods to 17.3% in the fourth period" (p. 74).

Effect of the Number of Pages

The number of pages is likely to affect the number of citations assuming citations are evenly spread across pages but this variable is not likely to affect the average age of citations

since the average would hold for the added pages and, for a similar reason, would not affect the type of citations. One difficulty with using the number of pages as a variable is that different textbooks are printed on different sizes of paper and use different font sizes. Generally, however, the paper size used for a book typically stays the same over the years of publication of a book and font size is similar. In a study of 32,878 references in 568 articles from 15 top psychology journals, Hooper, Wordofa, and Gibson (2017) found "a notable correlation between the number of pages and the number of citations in the sample articles, with the Pearson correlation coefficient being 0.812" (p. 274).

Effect of Whether References Were in Footnotes or a Bibliography

The use of footnotes rather than a bibliography would tend to inflate the number of citations. Chan (1999) made such a claim with respect to citations in Korean Studies journal articles when writing that "reference lists or bibliographies tend to have fewer referenced items than footnotes or endnotes" (p. 72). A citation may be used more than once in a book, a situation captured by the use of footnotes but not by the use of a bibliography. This difference in the frequency of citing a particular reference would affect the count of citations but would be less likely to affect the average age of citations. This difference depends on whether citations included more than once in the calculations did not have a different likelihood of being cited more than once and on how many additional citations occur due to the use of footnotes.

Summary

Numerous studies have been conducted on the relationship between the number of references in a piece of research and the quality of the research. Challenges to this relationship

on theoretical grounds argue that there are multiple reasons for including a reference in a piece of research. In addition, numerous variables affect the relationship between the number of references and indicators of quality. Despite the theoretical challenges and confounding variables, a consistent relationship has been found between multiple measures of quality and the number of references in an article.

Multiple studies have been conducted on the relationship between the age of the references used in a piece of research and the quality of the research. The theoretical basis for this claim is straightforward. Research using references that are more recent benefits from the latest developments in the field. Most references are dated within a few years of the research with a continually declining number of references at each age past a modal age. Variations from field to field exist regarding the modal age of references, and the rate of aging. Technical difficulties create imprecision in the exact dates of references by about a year creating errors in the analysis. Nevertheless, these qualifiers do not change the overall claim that the age of references is related to the quality of the research.

Certain sources are perceived as more credible than others. By custom, scholarly journals are perceived as credible because they are peer reviewed and accessible. Other sources may have lesser credibility depending on similar considerations.

Although research indicates the number, age, and type of references reflects the quality of a piece of research, the relationship between these variables has limitations. Most of the research was conducted on journal articles, not books. Tools to examine books are limited to graduate-level books published since 2005 whereas introductory college textbooks are not indexed and no bibliometric research was found that examined introductory public speaking textbooks.

Research on the references used in journals may not apply to introductory college textbooks. First, textbooks are frequently revised whereas a journal article is not. The revision process may result in better quality references being included in the books with each subsequent edition. Second, the audience for an introductory college textbook is different than the audience for scholarly journal articles. Students using an introductory textbook are provided basic information on the field whereas readers of journal articles seek cutting edge research on the field. As a result of the differences between journals and introductory textbooks, there is the possibility that the number, age, and type of references will vary from the patterns that exist for journals.

In the next chapter, the design of this study is explained. The design builds upon the literature reviewed in this chapter. Topics covered in the next chapter include the rationale for a bibliometric analysis, a description of the intended population of the study, a delineation of the sample, a review of criteria for selecting books, variables, data collection procedures, and methods to detect errors in the data.

CHAPTER 3

RESEARCH DESIGN

In this chapter, the research design will be described. In the first section, the rationale for the research design and methodology is presented. In the second section, the population of interest is described ranging from a very general characterization of it to a more specific population. The next section describes the sample. The fourth section details how data were collected, followed by a fifth section listing data analysis procedures.

Rationale for Research Design and Methodology

The rationale for the research design and methodology involves analyzing textbooks using bibliometric data. A bibliometric approach offers several methodological advantages. In this section, the advantages of the approach are detailed, followed by a review of the basic assumption of the research. Next, a retrospective analysis is compared to a prospective analysis. This analysis is followed by an explanation of the difference between a descriptive and an evaluative approach. Finally, a discussion of units of analysis is provided.

Three characteristics of a bibliometric approach to examining the communication of ideas can be identified. These characteristics were readily identified by early researchers in the field. First, as Parker, Paisley, and Garrett (1967) noted, a bibliometric analysis is unobtrusive. Second, as Smith (1981) argued, the information for a bibliometric analysis is readily available. Finally, Smith continues by noting that the data used in a bibliometric examination are nonreactive.

Retrospective versus Prospective Approach

The bibliometric approach used in this study is called a retrospective approach which involves an analysis of references in a publication. This technique is in contrast to a prospective approach in which citations to a publication are analyzed (Bouabid & Larivière, 2013). One reason for this choice is due to the certainty of the data. Results with a retrospective approach provide more certainty because no new references are added to a work once it is published. On the other hand, the possibility exists that a particular work will be cited at some time in the future. A more important reason is that the retrospective approach can be rapidly applied to a textbook. It can take years after a textbook is published for data to accumulate to estimate the citation pattern to the book whereas a retrospective analysis can be concluded shortly after the book is published, allowing an assessment of the book in the time period when a decision to adopt the book is made. A third reason for conducting a retrospective analysis is the lack of a citation index for undergraduate level textbooks.

Descriptive versus Evaluative Approach

The methodology used in this study involves what van Leeuwen (2005) describes as descriptive rather than evaluative bibliometric research. In a descriptive study, the references of similar works are described. In an evaluative study, a particular researcher's research is analyzed and this analysis is verified by the researcher. Consistent with this evaluative approach would be interviews with authors about their choice of references. This approach could offer insights a descriptive approach would miss but will not be used for several reasons. First, some authors listed as textbook authors may be dead. For example, Alan Monroe and Douglas Ehninger are

both currently listed as authors on an introductory textbook but Monroe died in 1975 and Ehninger died in 1979. Second, even more insight might be garnered if the results of this research were added to the material covered in an evaluative approach. Perhaps that approach is a project for another researcher or a later time.

Basic Assumption

A basic assumption of this research is that better information leads to higher quality research which leads to increased popularity of the research. The idea of "better" information can be operationalized as including more information, information that is more recent, or more information of a particular kind, e.g., from books or journals. That research using this better information is of higher quality is a more difficult claim to make since the notion of what constitutes quality is subjective. One way to objectify this subjectivity, however, is to quantify individual assessments of quality and aggregate these assessments. These assessments are then compared to similar works to produce a relative measure of quality. Assuming there are a sufficient number of assessments, the assessments are made by those who should understand the research, that the assessments are based on this knowledge, and that the works compared are similar, the relative measure should possess validity.

Based on this discussion, counts of citations, calculations of the average age of citations, and determinations of the proportion of each type of information can be a sound method. First, multiple editions would need to be examined to insure citation patterns are not based on some quirk in a particular edition. For example, the advent of internet search tools in the 1990s is likely to change the number, age, and type of references used by a textbook. Second, multiple books by different authors should be included in the research to insure citation patterns are

characteristic of a type of research, not a particular author. Third, the textbooks should be written by scholars in the field and used by teachers in the field to teach an introductory college-level public speaking course. For example, many books on public speaking are directed toward popular audiences or taught in a different setting, e.g., Dale Carnegie material on public speaking. Finally, the works need to be similar. Allen and Preiss (1990) addressed this issue when they selected public speaking textbooks for a content analysis of persuasive content. They excluded nine textbooks because they did not rely on social science research. For example, instead of relying on social science research, they noted that the textbook by Gregory (1987) was primarily based on interviews with professional speakers and the textbook by Powers (1987) relied on philosophical arguments. Although Allen and Preiss included Aristotle's *The Rhetoric* as a point of reference, it was not fully included in the study since it lacked a bibliography. Besides dissimilarity in the type of support a public speaking textbook uses and whether the text is geared toward a college audience, another point of comparison involves the type of college audience. For example, the public speaking textbook by Hemmert (2008) focuses on non-native speakers. The research presented in this work meets these standards.

Units of Analysis

The units of analysis that were considered in this research cover several issues. First, a particular book title was followed through all of its editions despite any changes in the authors of the title. Second, from each book, a determination was made about how to find citations from the book. Third, a determination was made about what counts as a citation. Finally, the level of the analysis is discussed.

Book Titles Versus Author(s)

The unit of analysis in this research was book titles rather than the author(s). In most cases the book title and the author(s) are the same but there are three notable exceptions. The most common exception involves the addition of authors. The second exception involves books in which a different author is assigned to each chapter. This situation arises with online textbooks created under a creative commons license such as the one written for the Public Speaking Project (Schreiber, 2013). The issue associated with both of these involves the continuity of the material in the book from edition to edition or the consistency in the type of material used in an individual book. The third exception is when the title of a book changed although its sequence in the progression of editions did not.

Changes in authors for a book title can involve the simple addition of an author or reshuffling of the order of the authors. In some cases, both changes are involved. In the second edition of the textbook by Andrews, Andrews, and Williams, a fourth author (W. W. Greico) was added. Usually such additions do not occur in such an early edition. Randall Osborn was not added as the third author until the eighth edition of the textbook by Osborn and Osborn and, in the 10th edition, Kathleen J. Turner was added as the fourth author. Rudolph Verderber wrote eleven editions of *The Challenge of Effective Speaking* before adding Katherine Verderber as the second author. Deanna D. Sellnow was added as the third author with the publication of the 14th edition. Diana K. Leonard was added as a second author to the book by Ross for the 12th edition of his book. Other title changes include the 2015 Verderber, Sellnow, and Verderber book that became *The Challenge of Effective Speaking in a Digital Age*. This occurred after 15 editions were published with the title *The Challenge of Effective Speaking*. Sellnow's first edition wa

titled *Public Speaking: A Process Approach* while the second edition adopted the title of *Confident Public Speaking*. In some cases, only the subtitle of a book changed. Vrooman's first edition included the lengthy subtitle *Why Most Presentations Fail and What You Can Do to Avoid Joining the Horde*. The subtitle was dropped in the second edition. Jaffe changed the subtitle of her book from *Public Speaking: A Cultural Perspective* to the second and subsequent edition title of *Public Speaking: Concepts and Skills for a Diverse Society*. Osborn and Osborn added a subtitle to their 9th edition published 2012 of *Finding Your Voice*.

Sometimes the order of authorship changes, reflecting changes in the contribution to the book by each author. After being added as the third author, Deanna D. Sellnow later moved to the position of second author of the 16th edition, relegating Kathleen S. Verderber to the position of third author. The most extensive example of changes in authorship can be found with the book *Principles and Types of Speech* originally authored solely by Alan Monroe. In the 6th edition, Douglas Ehninger was added as the second author. By the 8th edition, Ehninger was the first author, Monroe (deceased at this time) was listed as second author, and Bruce E. Gronbeck was added as the third author. By the 10th edition, Ehninger (deceased for six years at the date of publication) was still listed as first author but Gronbeck was now second author with Raymie E. McKerrow listed as third author followed by Monroe. By the 14th edition, Kathleen M. German was first author, followed by Gronbeck, Ehninger, and Monroe. As of the 18th edition, published in 2013, this order has stayed the same although Gronbeck died in 2014 so future changes may be likely.

In a few cases, the actual title of a book changed. Three examples were encountered. In 2018, *The Challenge of Effective Speaking* became *The Challenge of Effective Speaking in a*

Digital Age. The title by Ross changed names from *Speech Communication* to *The Speechmaking Process*. Finally, Sellnow changed her title from *Public Speaking: A Process Approach* to the title of *Confident Speaking*.

Several forces potentially contribute to maintain the continuity of a textbook despite changes in authors. First, there are frequently several editions during which new authors work with previous authors, allowing previous authors time to convey the philosophy of the book. Second, presumably new authors are selected because of their similar philosophy toward the subject matter. Third, publishers have incentives to insure that the integrity of the textbook is maintained since that tone is the basis for marketing the book. Fourth, new authors have an incentive to conserve their energy by not rewriting the book from scratch, keeping much of what was previously written. Authors who wanted to expend energy to pursue a major change in the philosophy of the book would most likely write their own book rather than impose a new philosophy on a book known for a different approach.

Forces can lead to a change in the continuity of a textbook across editions. First, if a textbook is not successful in the market, a new author may be brought in to change the tone of the book in the hope that it will strike a chord with buyers. Second, even for a successful text, changes in the marketplace necessitate that a text adapt; however, an author may not have the background needed to address these marketplace changes so a new author may be added. For public speaking textbooks, recent themes incorporated into textbooks include attention to the issues of diversity, civic engagement, and new technology.

The assumption this research makes is that changes in authorship will not make significant differences in how citations would naturally change across editions. If a writer had a

substantially different idea to convey, rather than editing an established text, it seems more likely that a new text would be written. Many publishers willingly offer such variations in public speaking textbooks. Pearson, for example, includes 20 different public speaking titles in their catalog in addition to two brief titles and five handbooks. The brief titles and handbooks are written by many of the same authors as those who wrote the full textbooks.

The second issue related to using a textbook title as the unit of analysis is the assumption that the entire textbook was created as a single unit by an author or group of authors working with a publisher. To create an open source public speaking textbook, the *Public Speaking Project* used different authors for each of the standard chapters. The authors also did not work with a publisher. The logic behind this choice recognizes that none of the authors would be financially compensated for writing an entire book so reducing the work required, decreases the financial disincentive. To date, the open source textbook has not been revised so the effect of revisions cannot yet be assessed. Although authors had page restrictions on the length of chapters, the degree of involvement of the coordinator of the program is unclear. Future researchers might treat such a book as a unique case in the research.

Determining the title of a subsequent or previous edition was sometimes made more difficult by changes in the wording of the title or the publication of related books. In the case of books by Ross and his subsequent co-authors, the first edition was titled *Speech Communication: Fundamentals and Practice*. A later change resulted in the title changing to *Speech Communication: The Speechmaking Process*. Still later, the title changed to *Introduction to the Speechmaking Process*. To add to the confusion, Ross published a hybrid book with a title that sounds like a public speaking book: *Essentials of Speech Communication*.

Source of References

As the name “bibliometrics” suggests, the approach used in this study examines the bibliographic information of the textbook. Three issues arise from using this information. First, this approach does not capture how often a reference is used within the book. Herlach (1978) writes that multiple mentions of a source reflect a close relationship between the cited and citing works. However, the focus of this research will not be the importance of a citation but the type, number, and age of the citation so frequency of use is not an issue. Second, there are variations in how books list their references. Some books use footnotes while others provide a bibliography. In some cases, a bibliography is provided at the end of each chapter and in other cases, the bibliography occurs at the end of the entire book. It is also possible that a book may embed full citation within the text or use a combination of methods. Depending on how references are counted, variations can cause overestimations or underestimations. Where references are listed at the end of a chapter or only listed in footnotes, references might be listed more than once. Either each reference must be checked against all the others to avoid duplication which is a time-consuming process or, for the sake of expediency, this bias can be ignored with the assumption that the bias is small and the ability to code more books compensating for the bias. On the other hand, references listed at the end of a textbook would only be counted once even if used multiple times in the book. An assessment of the degree of the bias will be determined at the beginning of this research with a sampling of books to determine exactly how references will be counted. Third, the use of a bibliography does not capture the influence of publishers, editors, reviewers, focus groups, survey participants, colleagues, support staff, and readers on the content of the textbook. In the field of science, Cronin (2008/2015) argues that

"storybook accounts of Great Men (and the occasional Marie Curie) typically give short shrift to the platoons of co-workers, technicians and sundry others…" (p. 123). The acknowledgements of Lucas (2015) provide a specific example related to introductory public speaking textbooks. In his book, he thanks 23 people who work for the publisher; 237 people who were reviewers, contributors, or participants in a symposium, focus group or survey; and an indeterminate number of students and teaching staff at the University of Wisconsin-Madison. An anecdotal indication of the effect of all the others involved is found in a November 28, 2017 email sent to book reviewers from Erika Guitierrez, publisher and senior program director at Bedford/St. Martin's who quotes Steve Gunn, the author of *Speech Craft* who states, "the final book is very different from the first draft of my manuscript, and has everything to do with your input." These contributions are overlooked in order to have a clear dividing line between substantial input and incidental influence. Also, as Cronin notes, not all "acknowledgements are necessarily records of substantial input" (p. 126).

Types of References

Unlike references in journals, references in textbooks are less likely to be a well-documented primary source of information. First, some references in introductory textbooks are provided as additional resources for the reader and were not necessarily used to write the text and they were placed in a separate section labeled as such so they were not coded. Second, some references to photographs only include the name of the copyright holder so photographic credits were ignored because of the lack of publication information and because they are likely to be included to make the text seem more readable, not because they relate to an argument made by the author(s). Third, some references to speeches by students do not include the date of the

speech or the source of the speech so were coded as having no date and classified as "other" references. References used in student speeches were treated as a secondary citation and were not coded.

Publication Year

The copyright date was used as the proxy for the publication year; however this is not always when the book was printed. For example, during the course of this research, two books were sent to the author from the publisher in October of 2016 but the copyright date was 2018. As another example, the second edition of Gamble and Gamble was received on January 24, 2017 even though it had a 2018 copyright date. It could be that all or most publishers follow this practice making the age of a book accurate in relation to other books, however, it is also possible that this is a practice that has changed over time, perhaps as a marketing tool, in which case distortions in the data may occur.

Level of Analysis

Data were analyzed with raw data, summary data for each book, and with various groupings of copyright dates. The raw data consist of information on 43,094 references used in the 177 editions of the 28 titles. For some analyses, such as the examination of the number of references, use of raw data allows the results to be weighted. At a second level, summary data for an edition are used so, for example, an edition with 50 references and an average age of 10 years for the references would be treated the same as an edition with 500 references and an average reference age of 10 years. Data at this level are analyzed, where relevant, with and without corrections for the number of pages in the edition. For example, the number of references would

be expected to be affected by the number of pages of the edition but the average reference age would not. At a third level, raw and summary data are grouped by title, 5-year groupings, and into pre-internet and post-internet groups. Groupings by title allow an evaluation of an author's practices. Groupings in 5-year spans smooths out some of the variability in the data. Dividing the data into pre-internet and post-internet editions was done to better assess the growth in the use of the internet by only examining data when the internet was available to authors.

Population

This study is broadly part of the body of research examining the citation patterns of authors in all of their forms of scholarship. This body of research primarily covers journals but also includes an analysis of the citation patterns related to dissertations, conference papers, and books. More recently, the field has expanded into an area labeled as altmetrics which involves the examination of citation patterns related to blogs, web pages, and social media. The connection to altmetrics in this research, however, will be limited to citations to alternative media by authors of textbooks rather than examining citations in alternative media.

Textbooks in general constitute a more narrow description of the population. Unlike other scholarly material such as journal articles, dissertations, or conference papers, textbooks possess a number of characteristics that make them a unique population. They are longer, do not go through the same editorial review process, may include less cutting edge research, and are frequently published in multiple editions.

Finally, recently published United States college-level introductory public speaking textbooks are considered to be the narrowest definition of the population of interest for this research. Textbooks that have multiple editions are a particular focus so that changes that

produced subsequent editions can be identified although some textbooks in their first edition are examined to assess how they compare to other first editions.

Sample

The first step in selecting a sample was to compile a list of relevant textbooks. The process of compiling this list is covered in the first section on the data set. The second section describes the criteria for selecting national edition, introductory public speaking textbooks published in the United States.

Data Set

A search for titles of United States national edition public speaking books with at least two editions published since 1970 was conducted on Textbooks.com, ABEbooks.com, WorldCat.org, Google.com/books and Amazon.com. Publishers' web sites were searched for public speaking books. Research on public speaking books was also used to identify titles.

The total number of potential books involved in this study was substantial. Sass (2009) writes that "for 2008 alone, at least 50 public speaking textbooks were marketed toward entry-level college public speaking courses by leading textbook publishers" (p. 2). A similar number published in earlier years is cited by Frobish (2000) who writes that there were 57 textbooks available between 1982-1997 and nine published between 1997 and 1999, "seven of which are simply revised texts from the first list" (p. 248). As suggested by the quotation from Frobish, many of these books have been issued in multiple editions, all of which are potentially part of this research. At the extreme end, *Principles of Public Speaking* by German, Gronbeck, Ehninger, and Monroe entered its 18th edition in 2012. Others with a large number of editions

include Verderber, Sellnow, and Verderber with 16 as of 2015, Ross and Leonard with 14 as of 2012, and Lucas with 12 as of 2015.

From over 150 textbooks identified, 28 book titles involving 178 total editions were selected in a quasi-random fashion. The name of each title was placed on a 4 x 6 notecard, shuffled and titles were drawn from the deck. Every edition for each title was acquired except for six editions of the book by Ross and one edition of the book by Valenzano and Bradon. Titles were selected, acquired and coded until a sufficient number of titles and editions within each title was reached.

General Criteria for Selecting Books

Textbooks selected for analysis met three general criteria. First, they were introductory public speaking books rather than introductory books from other fields. Second, the books were initially published in the United States. Third, the books were national editions, not custom editions. Details about each of these guidelines are explained in the following sections.

Introductory Public Speaking Books

Introductory public speaking textbooks were examined in this study for several reasons. First, these books were selected since much of the structure and lessons in them is similar to textbooks on the subject from 100 years ago (Berens and Nance, 1991; Gruner, 1993), and is based on texts from thousands of years ago written by Aristotle, Cicero, and Quintilian. The public speaking course seems to be unique in this way although changes in information production, searching, and retrieving alters the amount, recentness, and type of information available to authors. Second, in most schools, the basic communication course is a public

speaking course with 60.8% of schools reporting such an orientation (Morreale, Myers, Backlund, & Simonds, 2016). Third, the same survey also found that "almost 80% (79.4%, or N = 150) of respondents stated the basic course is part of their institution's general education (as compared with 50.2% in the 2004 study and 60.5% in the 2010 study)" (p. 344). Finally, as a general education requirement, Morreale, Myers, Backlund, and Simonds write that "the course serves to introduce students to the communication discipline, recruiting undergraduates as majors and acting as the primary means by which communication graduate students learn the praxis of communication education" (p. 338).

United States Books

This research was limited to United States editions for several reasons. First, the authors of interest are from the United States. Second, comparisons of the content of different introductory public speaking textbooks are based on research on U.S. editions. Third, public speaking courses are more prevalent in the United States compared to other countries. However, some of the textbooks studied have editions designed for other countries but these editions were created after the first edition of the U.S. edition. Stephen Lucas, for example, has a Canadian version adapted from his textbook and first published in 2007 as well as a version for China first published in 2009. Zarefsky also has a Canadian edition of his book co-authored with Jennifer MacLennan and first published in 1997, one year after his solely authored U.S. version.

National Editions

This research is limited to national editions, rather than custom versions. Custom versions may have added chapters or deleted chapters. Added chapters could come from the author; from

other textbooks the publisher owns the rights to, or from the instructor using the textbook. The focus of this research is on a single, primary work by the author or authors. This research, however, includes works in which new authors were added and old authors removed from a title. Although no textbooks created as an open educational resource were included in the study since none had gone into a second edition, they would otherwise be included in the population.

Limiting this research to national editions has two advantages. First, national editions reach a larger audience so the value of this research is enhanced by focusing on books with a wider distribution. Since national editions are frequently the starting point for customized versions, a substantial amount of influence from these editions still exists, even if material is added or deleted. Second, "the publication process for customized chapters is far less rigorous than for other, more traditional publication processes. There is no blind peer review for customized content—what a department sends to the publisher is placed within the customized textbook without question" (Sass 2009, p. 12). The intent of this research is to document this more rigorous process.

Nevertheless, the publication of custom versions of a textbook is significant in number and can be extensive in the scope of the customization. The survey of 188 basic course coordinators or basic course directors by Morreale, Myers, Backlund, and Simonds (2016) found that 42.9% of two-year schools and 25.7% of four-year schools use a customized version of a published textbook although some of these schools apparently also use a commercial published textbook. Consistent with these statistics, according to T. Schultz (personal communication, November 5, 2013), a book representative from Pearson, approximately 40% of the books from the publisher are custom editions. She further indicated that about half of these books added

content and half deleted content. Some content is added from other books and some is written by the instructor. For example, a custom edition of a textbook by Coopman and Lull (2003) produced for the College of Lake County and McHenry County College includes several faculty-written pages promoting the forensics team. A custom edition of Griffin (2006) included two pages describing the benefits of public speaking. These pages did not cite any sources. An example of more substantial changes to a textbook is provided by Saas (2009):

> Currently, the textbook for the basic course at this university (The Art of Public Speaking, eighth edition) contains two fully original chapters whose authors are faculty in the communication studies department. The content of those chapters includes a chapter-length treatment of the history of rhetorical theory and an equally comprehensive treatment of research methods for students, respectively. (p. 7)

Besides these additions, the textbook cited by Saas also deleted a chapter on small groups.

Reasons for customization generally fall into two categories: Financial and content. Numerous state governments have passed laws such as the College Textbook Transparency Act. The Federal government passed a law requiring publishers to sell textbooks to everyone for the same cost. To get around this issue, publishers offer custom textbooks that sometimes have only minor changes but they can then offer the text for a lower price. As an example of the extent of this price reduction, Sass (2009) notes that customization of the basic Lucas text at his university reduced the price to students from $102.25 to $70.35 and the department received a $5.00 royalty for each edition sold due to the original content that was added. Sass also indicated that customization allowed the department to adjust content to meet departmental course goals.

A second issue in selecting editions involves distinguishing textbooks designed for use as the primary text in a public speaking course and those that supplement the study of public speaking. Three related questions guided this decision. First, did the book include theoretical

content such as a model of communication or persuasive theories? Second, did the book include a bibliography of information used in the book? Third, how many pages long was the book? For example, the book by Kline and the Staff of Research & Education Association (2001) includes in the preface that the book is "a review and study guide," consists of only 72 pages of text, contains no bibliography, and provides no theoretical content on a model of communication nor on persuasive theories (p. ii). On the other hand, textbooks selected for this analysis are, on average, many pages longer, averaging 435 pages; are provided with supplemental educational material such as test banks, teaching manuals, videos and online resources; include theoretical material; and contain a bibliography.

Variables

There are three dependent variables of interest: the number of references per edition (a discrete ratio-level variable), the age of references (a continuous ratio variable), and the number of different types of references (a discrete ratio variable). A simple count using Excel calculated the number of references and the number of each type of reference. For references that included an age, the date of the reference was subtracted from the copyright date of the edition to get the relative age of each reference. References without a date averaged about 9 per title with a standard deviation of 8.45 and the range spanning from 0 to 65. The average reference age for an edition was computed by summing the relative ages and dividing by the number of references in which a date was provided.

Of interest in this research is how these dependent variables changed over time. Time was conceptualized as either the copyright year or the edition of the book. Since little research has been conducted on textbooks in multiple editions, the analysis focused on simple statistics to

explore the data and identify patterns for future researchers to investigate.

Several moderating variables were examined. The first of these was the number of pages in the book which was expected to affect the number of references and the number of different types of references but not the age of references. The second was whether references were in footnotes or a bibliography. Since there were coding issues with each of these that affected whether a reference was counted, a variable was created to allow it to be assessed.

Data Collection Procedures

Bibliographic data for each edition of each textbook was compiled in a Microsoft Excel spreadsheet. For each edition, two columns of data were collected. The first column contained the date of the reference and the second column contained information on the type of reference. The heading for each column identified the author, date of publication, and edition of publication.

The author and a student worker coded the books. To assess interrater reliability, 538 entries were separately coded (Cohen's kappa = .97). During coding, a log was maintained detailing coding issues. When issues arose, the two coders conducted further research if needed and discussed the issue to reach a consensus. Decisions reached were noted in the coding notes. These processes are discussed in the next sections.

Determining the Copyright Year and Edition

The copyright year and edition was found on the title page of each book. In cases where this information could not be found, the title page of a subsequent edition was consulted for a list of all the previous copyright dates for the title and this information was used to determine the

missing data and confirm other dates. In one case, the copyright date in the book differed from the copyright date listed in the subsequent edition. The title page of Jaffee's sixth edition indicates the copyright date is 2009 while the seventh edition indicates that the previous edition was copyrighted in 2010. The 2010 copyright date is consistent with the three year publication cycle of the title but the 2009 date was considered more authoritative so it was used.

Determining Whether References were in Footnotes or a Bibliography

American Psychological Association (APA) and Modern Language Association (MLA) style manuals were consulted for guidance on identifying the use of footnotes or a bibliography to document references. A book was classified as using footnotes when references were consecutively numbered and listed at the bottom of a page on which the reference was used. Bibliographies took two forms: End of chapter bibliographies or end of book bibliographies. Both types of bibliographies were coded the same way under the assumption that references used for a particular chapter were unlikely to be used in other chapters on a different topic.

Determining the Date of References

Determining the date of the reference was generally straightforward but there were exceptions. One rule that was followed was to use the most recent date included in the reference. For example, if a book was published in 1915 and republished in 2015, the later date was used under the assumption that the republication indicates current relevancy. As another example, if a reference indicates that it was published in 2014/2015, the more current date was used. Although at least one researcher (Coffman, 1985) used the opposite rule, the rule here is used to minimize the chance that textbook authors were claimed to not update their book when, in fact, they did,

i.e., minimizing Type I errors. A second rule that was followed was to break references into separate parts if they refer to different material. For example, if a student speech from 2014 is cited as having quoted an article published in 2013, both the speech and the article are listed in the spreadsheet separately even though they are contained in a single citation since they involve the interpretation of the speaker and the research of the author of the article. Third, if the date was missing, WorldCat.org, Google Scholar, or another appropriate reference was consulted for the date. If a date still could not be found, a code of "n.d." was entered. Fourth, when a speech is reprinted in a book, the date of the book, not the date of the speech is used. Fifth, for material found on the internet, the date the material was created, not the date the material was accessed was used. If the date of creation was not listed, the date of access was used.

Determining Page Counts

In counting the number of pages, the preface was ignored while glossaries, appendices, bibliographies, and indexes were counted. Glossaries, bibliographies, and indexes were counted to provide uniformity across books since these were embedded within some texts, such as end of chapter material and footnotes, while listed at the end of other books. Appendices were also counted since they typically contained sample speeches that were integrated into chapters in other books. Typically the last numbered page was used as the page count but if material at the end was numbered differently than the main text, the page numbers of the end material was added to the page numbers of the main text. Based on how pages were counted, counts will naturally differ from those provided by publishers.

Determining Reference Counts

In coding citations when footnotes were used, if there was an indication that the reference had already been cited in the chapter (e.g., through the use of "ibid"), that repetition was not coded in an attempt to make the count equivalent to what it would have been if the edition used a bibliography. For all texts that used footnotes, the citations were based on material for that chapter, thus data for a citation would not be duplicated if cited again in a chapter but would be duplicated if cited in a different chapter. This is the same procedure used for books with end-of-chapter bibliographies. The assumption is that references used in one chapter are unlikely to be used in another.

Most references to an external resource were counted but with some exceptions. Photo credits were not counted. If a book had chapter end notes or a bibliography, references to material not included in these was not counted, e.g., within text citations not included in a footnote or bibliography. The frequency of this occurrence was not investigated but casual observation revealed that authors sometimes did not include the source of quotations in their footnotes or in the bibliography. When counting references where chapter end notes were used, once a reference was counted in a chapter, it was not counted in that chapter again. However, it the reference was cited in another chapter, it was counted again. The use of "ibid" or a shortened citation was used as a guide as to whether a reference was already cited in a chapter. In one unusual case, the following undated entry in chapter end notes was counted and given a code of "other" in the tabulation of data for O'Hair, Rubenstein, & Stewart (2007): "Note to Production: endnote reference to come, will need to double check with authors" (p. 296).

Determining the Type of Reference

Generally, the format of the reference was used to determine what type of reference it was. Familiarity with the APA and MLA manual was used in this regard. Categories included books, chapters in books, conference papers, dissertations, internet web pages, journals, newsletters, newspapers, and other categories. For all but the internet web pages, chapters, and newsletters, if the reference was of the type listed but found on the internet, a separate category was created for each internet version of a book, chapter, conference paper, dissertation, journal, newsletter, newspaper or other category, e.g., internet book. No chapters or newsletters were found on the internet so the category of internet chapter or internet newsletter was not used. A few special rules were developed. Items included in a category labeled "other" included the *Congressional Record*, references to speeches that did not list any place of publication, poems, songs, TV shows, pamphlets, laws, statutes, court cases, library papers, answers to a survey, TV interviews, email, audio cassettes, advertisements, unpublished papers, comments by an anonymous reviewer, and questionnaires. *Vital Speeches* was coded as a magazine. Conference publications printed as a book were categorized as a book while individual papers in the book were categorized as a chapter.

Error Detection Procedures

Data were initially compiled in a Microsoft Excel spreadsheet with various formulas used to calculate statistics involved in identifying errors in the data. For each edition of a title, there were two columns associated with the edition. One column contained the date of each reference and another column contained the type of reference created. At the end of each column, various

statistics were computed and these were used to detect errors.

First, for the column containing the date of each reference, a count was made of the number of cells with data. This was compared to a count of the number of cells that contained a number added to a count of the number of cells that contained "n.d." (no date). If these two numbers did not match, the column was inspected for cells without data or for stray characters. Errors were corrected until the two statistics matched.

A second test involved comparing the column containing reference dates and the column listing the type of reference. For each column, a count was made of the number of cells containing data. If these numbers did not match, a search was made for cells without data and the correct data were inputted by consulting the original edition. Errors were corrected until the two statistics matched.

For the third test, the distribution in the age of references for each edition was inspected for errors. A count was made of the number of references for each year from 2018 to 1900 with added categories of "n.d." (no date) and "pre-1990." A sum of this distribution was compared to the sum of cells with dates to assess whether they matched. If not, there was a mistyped date, e.g., "19999" rather than "1999." The distribution was also inspected for dates that were more recent than the copyright date of the book. Errors were corrected until the two statistics matched.

As a fourth test, the total count of the number of cells with data in the "Reference Type" column was compared to the sum of the individual counts for each type of reference. If these did not match, there was a mistyped code for the type of reference. Errors were corrected until the two statistics matched.

Next, changes in the reference count from one edition to another were inspected. If these

didn't seem to follow a pattern, the data was checked to make sure all the bibliometric data for the edition was coded. This check was performed after multiple editions were coded to better enable detection of errors.

As a final check, the standard deviation in the age of references was computer and compared to other editions of a title. If the standard deviation seemed to vary greatly, the data would be examined for mistyped numbers or for some other explanation. This check was performed after multiple editions were coded to better enable detection of errors.

Data Analysis Procedures

Data were analyzed using Microsoft Excel 2010 and version 24 of IBM SPSS Statistics, formerly known as the Statistical Package for the Social Sciences (SPSS). Excel was used during data collection since multiple data compilations and tables could be created and edited in a single file. Some data compilations included material not included in this work such as work records (hours worked, amount of coding accomplished in that time), or book purchase records as well as preliminary analyses such as tables showing the number of references per edition or per year. Switching from one set of data to another was made easier by the data being in one file separated by tabs. Searches for data were also easier in Excel. Some data checking activities were also found to be easier in Excel such as temporarily deleting chunks of data to determine if errors in counts were attributed to the deleted chunk of data. Since Excel automatically recalculated formulas and could undo the deletion with a click on one button, it was faster than SPSS. Although Excel was used to generate some statistics, SPSS was used to verify them and to perform more advanced statistical functions that could not be performed with Excel.

In determining which statistics to generate, several guidelines were followed. First, the statistics chosen helped answer the research question. Second, the statistics helped model and assess the data. Third, the statistics were comparable to those generated by other studies so comparisons were possible. Finally, since there is little research of the bibliometrics of introductory textbooks, especially public speaking textbooks, the analyses were exploratory rather than designed to test hypotheses and were kept simple, leaving it to future researchers to explore complex interactions between variables.

The rationale for the choice of statistical analyses relates these guidelines to a variety of statistics including counts, averages, percentages, scatter plots with regression lines, measures of variance explained, and measures of significance. Not all guidelines apply to the three research questions. The analysis reviews these beginning with the simplest methods of analysis and progresses to the more sophisticated.

Counts were made of the number of references, the number of each type of reference, and the number of entries with a date. One reason for the counts was to check for errors. The number of entries with a date, for example, should equal the number of entries in which a type of reference was specified. An accurate count was needed to provide an accurate answer to the research questions. A second reason for counts was to provide a statistic that could be used to explain the extent of change in the number of references and the number of each type of reference. Third, counts were used to adjust other data by the count, i.e., to weigh the other data, convert them to an average, or to convert them to a percentage. Counts were used in this way by other studies.

Percentages were calculated in the examination of the distribution of types of references

and for the distribution of references in different age groups. Percentages were not calculated related to the number of references because there was only one characteristic of interest about the number, i.e., the actual number. The percentage of references was not evaluated by a grouping variable such as year or edition because other statistics assessed this better. Other studies have used percentages to examine issues such as the percentage of references that fall within a certain time period or the percentage of references that are of a particular type. These kinds of issues are examined in this study.

Means and medians were calculated in the examination of the age and type of references. To a lesser extent, the mean was calculated when examining the number of references but only to the extent that the mean number of references per 100 pages was calculated. Averages serve as a simple model to represent the typical value of the data. In the case of the mean, the value represents the central tendency of the data but possibly includes biasing outlier data. To account for outliers, the median was also calculated. Averages are commonly used in bibliometric research.

Scatter plots were created to provide a visual representation of the data. These plots suggested relationships between variables that would be harder to spot in strings or tables of data. Regression lines fit to the data tested linear, quadratic, or cubic relationships. The variance explained by regression lines allowed for an assessment of each model.

Depending on the type of data (i.e., nominal, ordinal, interval, or ratio), a variety of tests of significance was conducted. The scatter plots with regression lines generated correlations but the correlations do not establish whether the relationship is statistically significant, only the degree of relationship. As a result, t-tests, chi-square tests, and ANOVAs were used to assess

whether relationships were statistically significant at the 0.05 level, a commonly used threshold.

In the next section, the data were analyzed for each research question. Tables showing summary data are presented. Scatter plots of data are provided along with an indication of the degree of correlation and explanatory power different variables have.

CHAPTER 4

RESULTS

Research Question #1

To what extent does the number of references used in subsequent editions of United States national edition introductory college public speaking textbooks change? To answer this question, the average (mean and median) age of references published in different editions was examined with tables and graphs for any trends. A regression analysis was also conducted.

The analysis by edition shows a snake-like relationship between the mean number of references and the edition of the textbook characterized by an increasing relationship followed by a decreasing relationship followed by another increasing relationship. Table 4 shows the data with Figure 1 depicting a line graph of the data. Except for the third edition which showed a small decrease in the mean number of references (but not the median) compared to the previous edition, the average number of references increased for each edition until the seventh edition. This was followed by a decrease in the mean number of references for each edition from the eighth to the eleventh. There is no clear pattern in the mean number of references from the twelfth to the seventeenth edition.

Since extreme cases may bias the results, the median of each interval was also computed with little effect from extreme cases found. The same pattern emerged of an increasing median number of references by edition with a decrease in the median number of references occurring

Table 4

Average Number of References by Edition Using Summary Data

Edition	Number of Books	Mean Number of References	Mean Number of References if Editions Equal to or Greater Than this Edition are Combined	Median Number of References
1	25	215.12		164.0
2	26	236.35		196.0
3	22	243.09		228.0
4	18	287.67		261.0
5	16	282.38		270.0
6	15	306.47		293.0
7	13	293.92		264.0
8	9	205.86	206.24	216.0
9	7	205.86	188.64	214.0
10	6	207.67	184.00	179.0
11	4	165.50	154.95	145.5
12	4	179.75	179.75	158.5
13	3	161.67	179.75	146.0
14	3	158.33	185.78	160.0
15	2	185.50	199.5	185.5
16	2	207.00	206.5	207.0
17	2	206.00		206.0
Total	177	246.59		217.0

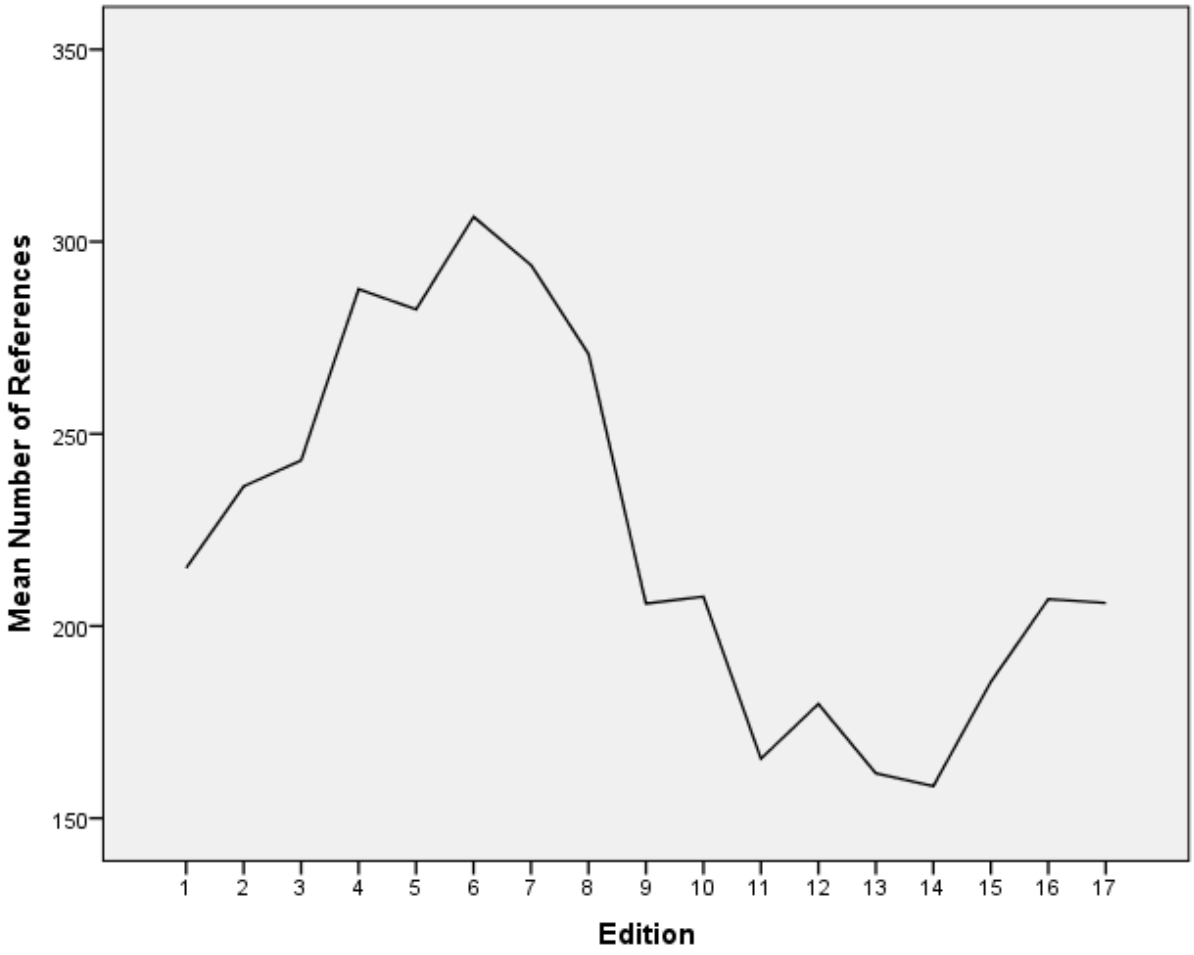

Figure 1: Mean number of references for each edition using summary data.

with the seventh edition instead of the eighth edition and continuing until the eleventh edition. From the twelfth to seventeenth edition, there is a pattern involving an almost continuous increase in the median number with the thirteenth edition being an exception due to a slight decrease over the previous edition. A line graph showing this pattern is shown in Figure 2.

The small number of titles with more than seven editions may explain this result or changes in authors in later editions may contribute to changes in patterns of reference use. As shown in Table 4, if data for all 32 editions after the 7th are combined, the increase in the mean number of references in the four highest editions is overshadowed by the 28 other books and an inverted u-shaped curve without an added upward tail at the end occurs. The same result occurs if only the 26 books after the 8th edition are combined, if only the 21 books after the 9th edition are combined, and if only the 17 editions after the 10th edition are combined.

Not all textbooks have the same number of pages so the number of references for an edition was divided by the number of pages and multiplied by 100 to produce the number of references per 100 pages. The result was to increase the variance. Figure 3 shows a line graph of this data using summary statistics. Figure 4 shows a line graph of this data using raw data. Table 5 shows data that confirms the increased variance. The range of each edition for both the number of references and the number of references per 100 pages was divided by the standard deviation for each division to produce a z-score representing the number of standard deviations the range covers. For the first eleven editions and the fifteenth edition, the normalized variance in the range for the number of references per 100 pages is greater than the normalized variance in the range for the number of references. For the twelfth, thirteenth, and fourteenth edition, the opposite is true. For the sixteenth and seventeenth editions, the difference is trivial (less than

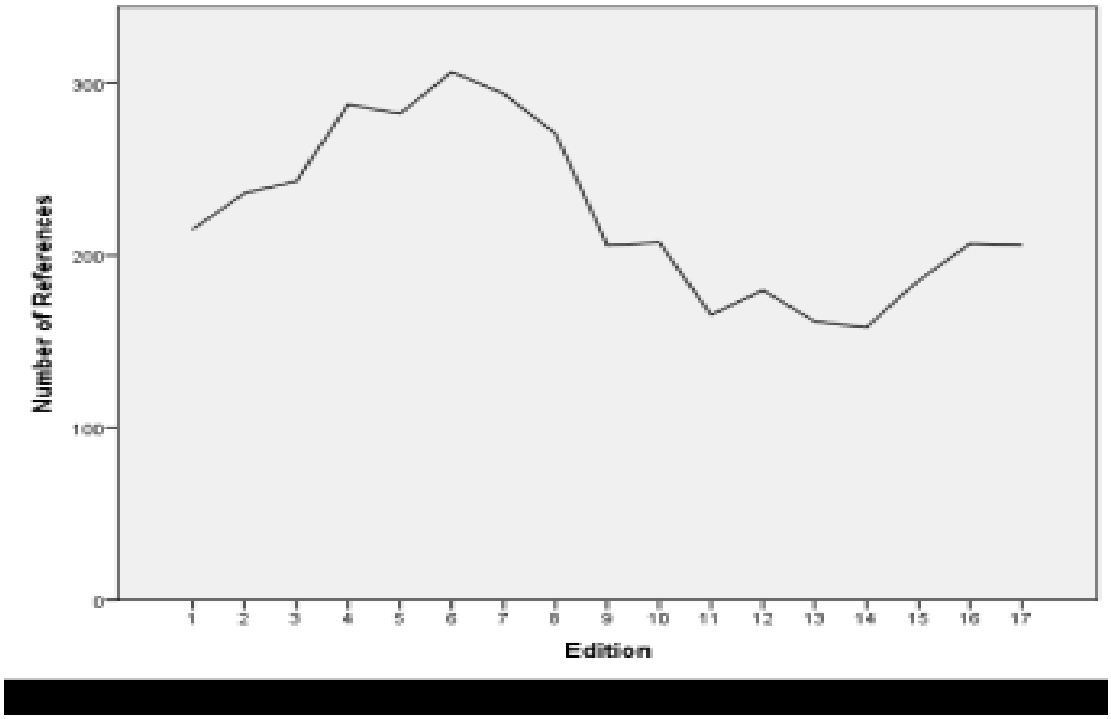

Figure 2: Median number of references for each edition using summary data.

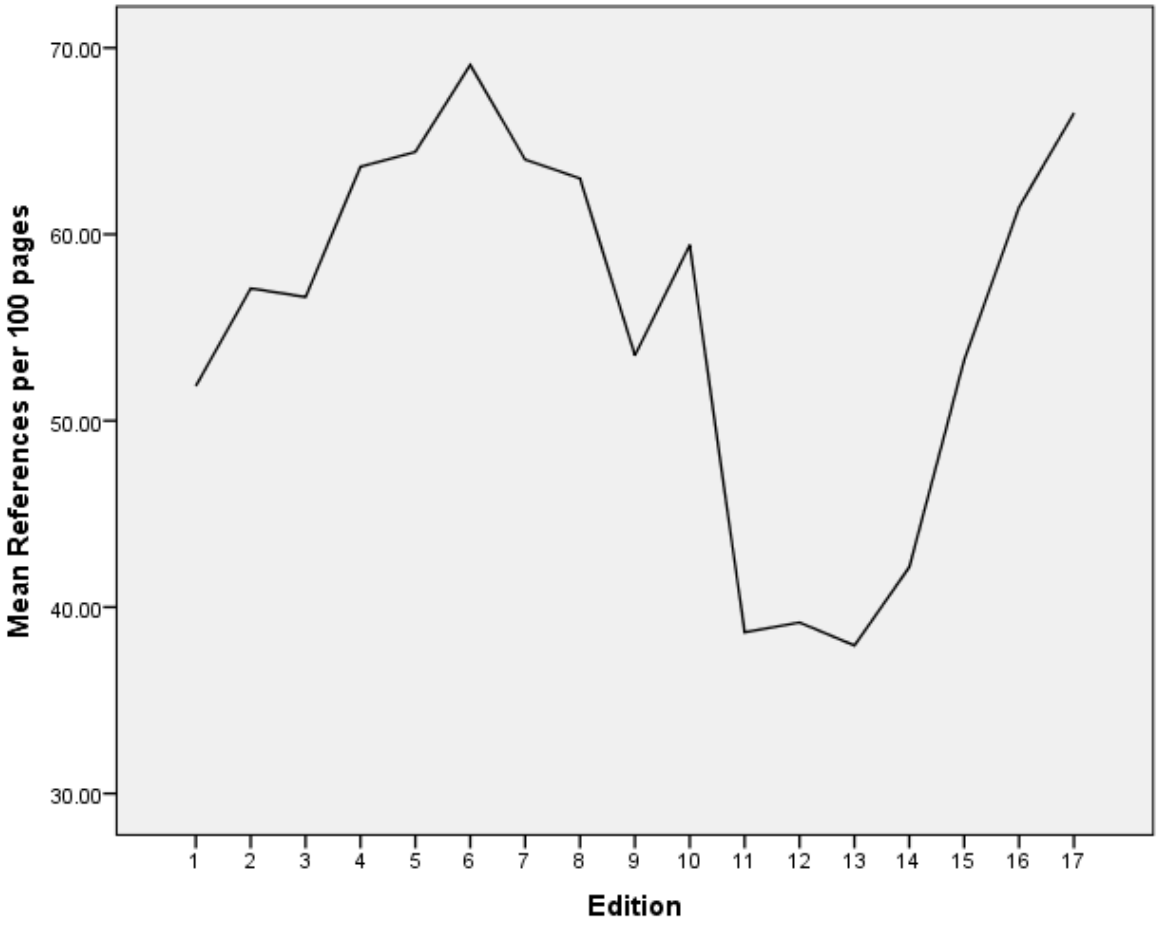

Figure 3: Mean number of references per 100 pages for each edition using summary data.

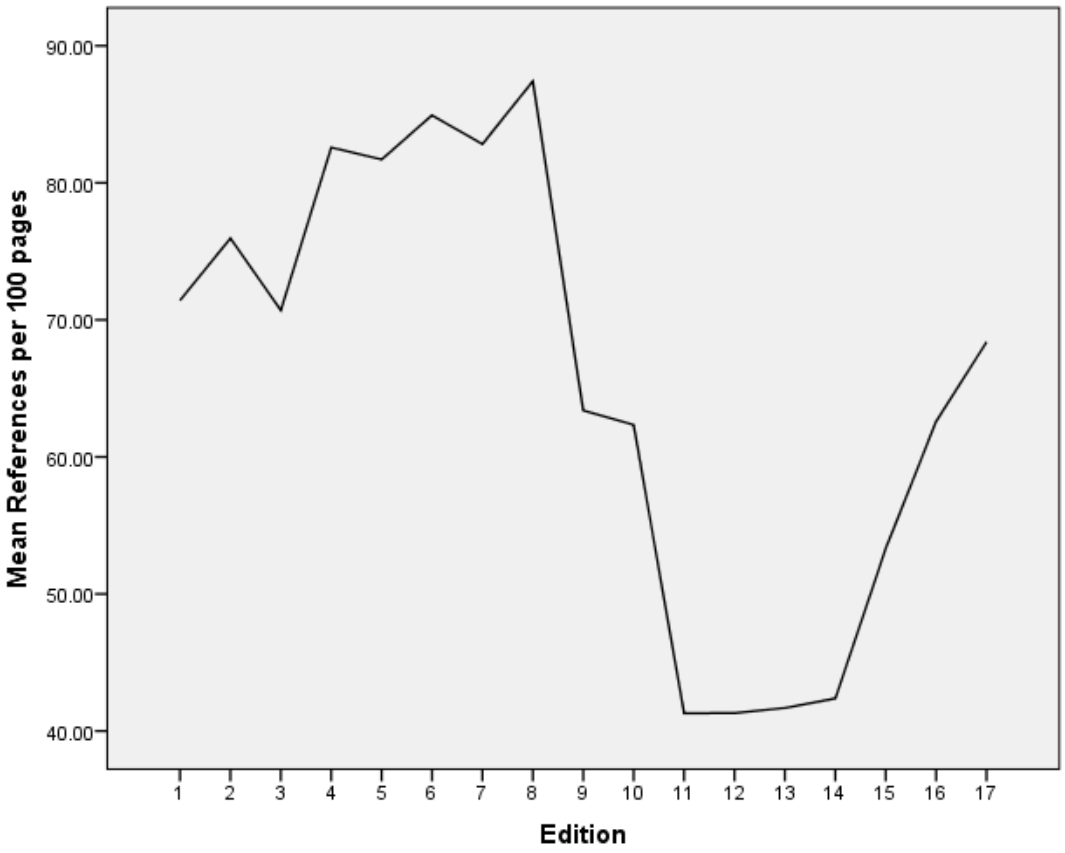

Figure 4: Mean number of references per 100 pages for each edition using raw data.

Table 5

Range, Standard Deviation, and Z-Score for the Average Number of References per Edition in Total and per 100 Pages

Edition	N		References per 100 Pages	Number of References	Difference
1	25	Range	148.64	497	
		Std. Deviation	35.93009	142.007	
		Z-Score	4.13692256	3.499827	0.6370956
2	26	Range	133.66	498	
		Std. Deviation	36.0007	138.438	
		Z-Score	3.71270559	3.597278	0.1154276
3	22	Range	125.83	490	
		Std. Deviation	30.68339	127.9	
		Z-Score	4.10091584	3.831118	0.2697978
4	18	Range	149.08	578	
		Std. Deviation	38.84109	157.579	
		Z-Score	3.8382033	3.668001	0.1702023
5	16	Range	144.67	568	
		Std. Deviation	35.53424	157.747	
		Z-Score	4.07128449	3.600702	0.4705825
6	15	Range	122.02	497	
		Std. Deviation	35.94233	155.979	
		Z-Score	3.39488286	3.186326	0.2085569
7	13	Range	138.04	554	
		Std. Deviation	37.67253	165.68	
		Z-Score	3.66420838	3.343795	0.3204134

(continued on following page)

Table 5 (continued)

Edition	N		References per 100 Pages	Number of References	Difference
8	9	Range	141.62	473	
		Std. Deviation	46.2118	170.271	
		Z-Score	3.06458524	2.777925	0.2866602
9	7	Range	89.64	277	
		Std. Deviation	30.84595	100.324	
		Z-Score	2.90605412	2.761054	0.1450001
10	6	Range	81.69	212	
		Std. Deviation	28.70726	77.226	
		Z-Score	2.84562163	2.745189	0.1004326
11	4	Range	21.45	155	
		Std. Deviation	8.86554	68.257	
		Z-Score	2.41948037	2.270829	0.1486514
12	4	Range	17.36	150	
		Std. Deviation	7.97434	66.755	
		Z-Score	2.17698267	2.247023	-0.0700403
13	3	Range	23.63	141	
		Std. Deviation	12.90347	71.794	
		Z-Score	1.83129034	1.963952	-0.1326617
14	3	Range	16.92	13	
		Std. Deviation	9.03645	6.658	
		Z-Score	1.87241671	1.952538	-0.0801213

(continued on following page)

Table 5 (continued)

Edition	N		References per 100 Pages	Number of References	Difference
15	2	Range	1.42	39	
		Std. Deviation	1.00107	27.577	
		Z-Score	1.41848222	1.414222	0.0042602
16	2	Range	11.5	82	
		Std. Deviation	8.13454	57.983	
		Z-Score	1.41372469	1.414208	-0.0004833
17	2	Range	19.31	80	
		Std. Deviation	13.65542	56.569	
		Z-Score	1.41409052	1.414202	-0.0001115
Total	177	Range	152.69	599	
		Std. Deviation	33.79119	139.598	
		Z-Score	4.51863341	4.290892	0.2277414

0.0005 standard deviations). The small number of books (four or less) for editions greater than the twelfth indicates the results for higher number editions should not be given too much meaning. The results for earlier editions, however, indicate that the number of pages in a book is related to the number of citations. Overall, there is a significant relationship between the number of pages and the number of references (p = .008) although the linear relationship between the two explains only 4% of the variance.

To determine if individual series of editions of a title matched the pattern found in the summary statistics of Table 4 and Figures 1, 2, 3, and 4, the number of references for each title was examined. The data for the number of references are found in Table 7 and the data for the number of references per 100 pages is found in Table 8. Table 6 lists the corresponding author(s) and copyright dates of the title numbers used in Table 7 and Table 8. Of the 25 titles in the study for which a first edition was coded, 23 of them generally exhibited a pattern in which the number of references increases with each of the early editions followed by a decrease starting at around the 5^{th} to 8^{th} edition. The most notable exception in which the number of references decreases in the second edition are editions by Gamble and Gamble (title 8) containing 73 fewer references. Lesser exceptions include Jaffee (title 14) with 30 fewer references, Rothwell (title 22) with 19 fewer references, Hamilton (title 12) with 17 fewer references, Zarefsky (title 28) with 7 fewer references, and Valenzano and Braden (title 25) with 5 fewer references. When the number of references per page is considered, Rothwell (title 22) is the greatest exception with a 14.5 decrease in references per page followed by Vrooman (title 27) with a 11.4 decrease in references per page, Gamble and Gamble (title 8) with a 5.0 decrease in references per page, and Valenzano and Braden (title 25) with a 1.2 decrease in references per page. With few exceptions,

Table 6

Title Number, Corresponding Author(s), and Copyright Dates

1	Beebe and Beebe (1991, 1994, 1997, 2000, 2003, 2006, 2009, 2012)
2	Brydon and Scott (1994, 1997, 2000, 2003, 2006, 2008, 2011)
3	Coopman and Lull (2009, 2012, 2015, 2018)
4	Devito (2003, 2006, 2009, 2012, 2015)
5	Ford-Brown (2010, 2014)
6	Foss and Foss (1994, 2003, 2012)
7	Fraleigh and Tuman (2009, 2011, 2014, 2017)
8	Gamble and Gamble (2016, 2018)
9	Gregory (1987, 1990, 1993, 1996, 1999, 2002, 2005, 2008, 2010, 2013)
10	Grice and Skinner (1993, 1995, 1998, 2001, 2004, 2007, 2010, 2013) ; Grice, Skinner, and Mansson (2016)
11	Griffin (2003, 2006, 2009, 2012, 2015, 2018)
12	Hamilton (2003, 2006, 2009, 2012, 2015)
13	Hogan, Andrews, Andrews, and Williams (2008, 2011, 2014)
14	Jaffe (1995, 1998, 2001, 2004, 2007, 2009, 2013, 2016)
15	Lucas (1983, 1986, 1989, 1992, 1995, 1998, 2001, 2004, 2007, 2009, 2012)
16	Metcalf (1991, 1994, 1998, 2000, 2004, 2007, 2010)
17	Monroe and Ehninger (1974); Ehninger, Monroe, and Gronbeck (1978); Ehninger, Gronbeck, McKerrow, and Monroe (1982, 1986); Gronbeck, McKerrow, Ehninger, and Monroe (1990, 1994, 1997); McKerrow, Gronbeck, Ehninger, and Monroe (2000); German, Gronbeck, Ehninger, and Monroe (2001, 2004, 2007, 2010)
18	O'Hair, Rubenstein, and Stewart (2004, 2007, 2000, 2013, 2016)
19	O'Hair, Stewart, and Rubenstein (2001, 2004, 2007, 2010, 2012, 2015)
20	Osborn and Osborn (1988, 1991, 1994, 1997, 2000, 2003, 2006) Osborn, Osborn, and Osborn (2009, 2012) Osborn, Osborn, Osborn, and Turner (2015)
21	Ross (1970, 1983, 1986, 1995, 1998) ; Ross and Leonard (2007, 2009, 2012)
22	Rothwell (2014, 2017)
23	Sellnow (2002, 2005)
24	Sprague and Stuart (1984, 1988, 1992, 1996, 2000, 2003, 2005, 2008); Sprague, Stuart, and Bodary (2011)
25	Valenzano and Braden (2012, 2015)
26	Verderber (1970, 1973, 1976, 1979, 1982, 1985, 1988, 1991, 1994, 1997, 2000); Verderber and Verderber (2003, 2006); Verderber, Verderber, and Sellnow (2008); Verderber, Sellnow, and Verderber (2012, 2015, 2018)
27	Vrooman (2013, 2015)
28	Zarefsky (1996, 1999, 2002, 2005, 2008, 2011, 2014)

Table 7

Number of References for Each Edition of a Title

Edition → Title ↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	166	206	247	250	315	437	523	516									
2	141	170	177	162	187	191	217										
3	471	536	523	623													
4	128	143	141	155	176												
5	51	63															
6	65	116	149														
7	164	199	261	275													
8	356	283															
9	116	137	184	260	293	287	298	299	222	166							
10	193	196	198	257	248	261	242	216	190								
11	280	282	352	368	361	377											
12	429	412	451	572	586	460											
13	483	514	498														
14	282	252	279	325	378	450	580	488									
15	129	186	207	219	224	226	224	185	214	176	159	171					
16	224	305	304	309	292	282	330										
17							264	212	335	262	263	277	241	160	166	166	166
18	152	196	204	227	154												
19	171	207	263	279	314	317											
20	150	196	254	448	503	523	503	410	314	336							
21			311			311	348			182	136	146	146	151			
22	521	502															
23	300	352															
24	37	38	33	47	28	26	26	43	58								
25		131	126														
26	22	46	54	61	72	58	65	78	107	124	108	126	99	164	204	248	246

Table 8

Number of References per 100 Pages for Each Edition of a Title

	Edition																
Title ↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	38.0	43.5	49.0	49.4	63.7	89.1	106.5	117.3									
2	28.3	33.7	38.2	37.8	42.0	39.8	48.2										
3	99.2	141.8	134.1	158.9													
4	42.7	44.7	42.9	50.3	51.8												
5	9.2	12.5															
6	42.2	57.4	66.8														
7	23.5	26.9	35.1	37.8													
8	61.1	56.2															
9	28.5	36.4	42.8	57.5	62.5	60.5	62.4	66.7	100.0	107.1							
10	40.5	42.1	44.4	52.3	52.2	58.4	58.6	52.0	55.4								
11	54.3	60.3	74.3	86.6	101.1	105.3											
12	94.5	111.7	121.9	151.3	151.3	128.5											
13	92.9	101.6	102.0														
14	63.2	67.0	65.8	77.9	92.0	111.1	144.3	149.5									
15	32.4	44.7	50.0	52.9	48.6	44.8	43.5	32.8	40.5	39.8	38.2	40.9					
16	56.7	63.0	57.0	54.3	73.0	72.1	84.2										
17							42.2	43.1	75.1	58.7	50.5	49.7	52.7	48.8	52.5	55.7	56.8
18	55.5	62.4	60.5	63.9	48.3												
19	26.0	35.0	46.0	74.8	85.7	83.4											
20	30.5	40.2	50.0	76.8	98.2	105.2	89.2	78.5	68.4	74.7							
21			74.6			78.7	86.8			50.8	36.9	32.4	31.9	31.9			
22	157.9	143.4															
23	60.4	68.2															
24	9.5	9.8	8.2	9.8	6.6	6.5	7.9	7.9	10.4								
25	34.4	33.2															
26	9.3	16.7	18.6	19.4	18.6	14.8	16.0	19.1	24.8	25.4	29.0	33.7	29.1	45.8	53.9	67.2	76.2
27	113.1	101.7															
28	27.2	29.4	30.5	33.4	35.1	38.1	44.1	34.7									

then, the general pattern of more references with each edition holds for most individual titles through early editions of a title.

The analysis of five-year intervals showed a similar general trend of an increasing mean number of references with age but no inverted U-shape. Table 9 shows the data. Data were grouped by five-year intervals to increase the number of books in each time range. After an initial increase followed by a drop in the mean number, there is a steady increase in the number of references from 1984 to 2018. Figure 5 provides a representation of the data. Since extreme cases may bias the results, the median of each interval was also computed and inspected. A pattern of an increasing median number of references with age still showed although with less consistency. Figure 6 shows a depiction of these data. The similarity between the mean and median data and graphs led to a decision to only look at the mean in subsequent analyses.

Other permutations in the analysis were also conducted. A graph of the mean number of references per 100 pages organized in 5-year periods (Figure 7) was created using summary data and this graph compared to two other graphs. First, this graph was compared with Figure 5 which showed a graph of a simple mean using the same data and time intervals. Again the graphs appeared similar except that the peak in the 1974 to 1978 time period in Figure 5 was flattened as it covered two 5-year time periods from 1974 to 1983. This is explained by 1974-1978 having more references but their being an imbalance in the number of pages contained in books for the two periods. In particular, this means that either editions in the 1974-1978 range have more pages than expected or the editions represented in the 1979 to 1983 range have fewer than expected, based on the unadjusted mean. Second, Figure 7 which used summary data was compared to Figure 8 which used raw data. The overall pattern stayed the same but the initial

Table 9

Average Number of References by Five-Year Intervals

Time Interval	Number of Books	Mean Number of References	Median Number of References
1969-1973	2	36.00	36.00
1974-1978	4	210.25	238.00
1979-1983	5	182.20	129.00
1984-1988	9	140.22	117.00
1989-1993	11	173.09	193.00
1994-1998	24	209.79	216.00
1999-2003	26	236.00	238.50
2004-2008	31	244.87	214.00
2009-2013	40	289.80	219.50
2014-2018	25	332.12	336.00
Total	177	246.59	217.00

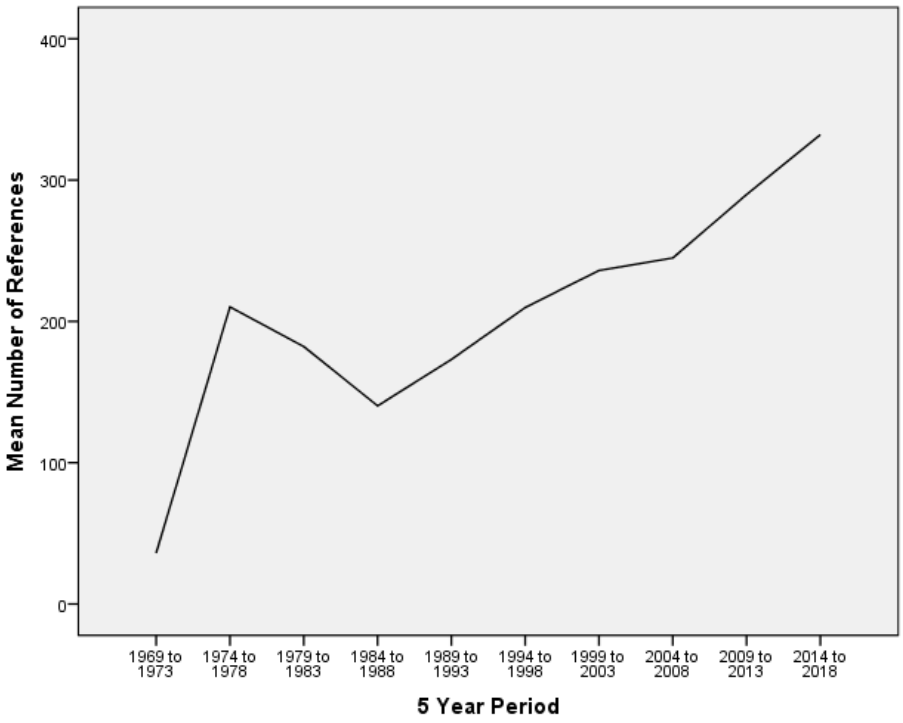

Figure 5: Mean number of references in 5-year periods using summary data.

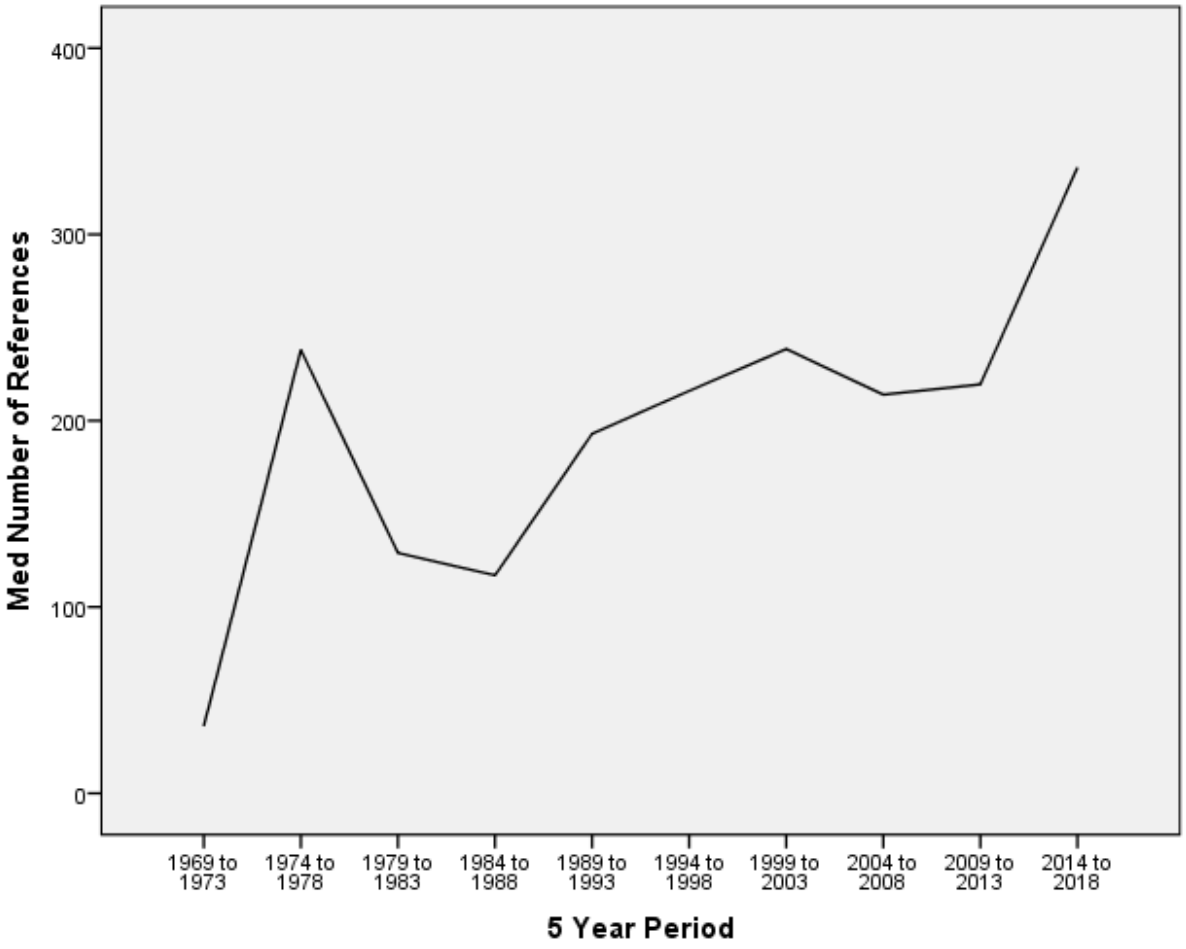

Figure 6: Median number of references in 5-year periods using summary data.

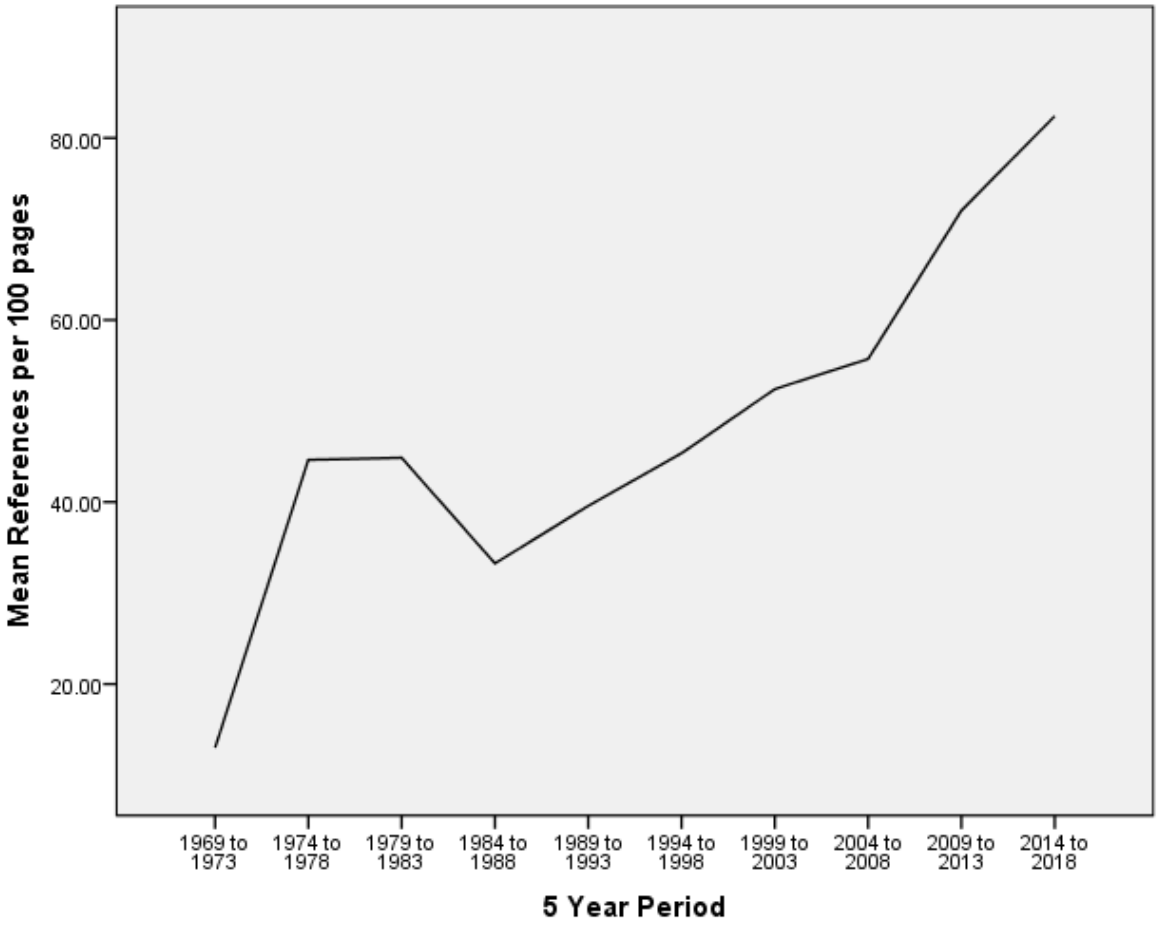

Figure 7: Mean number of references per 100 pages in 5-year periods using summary data.

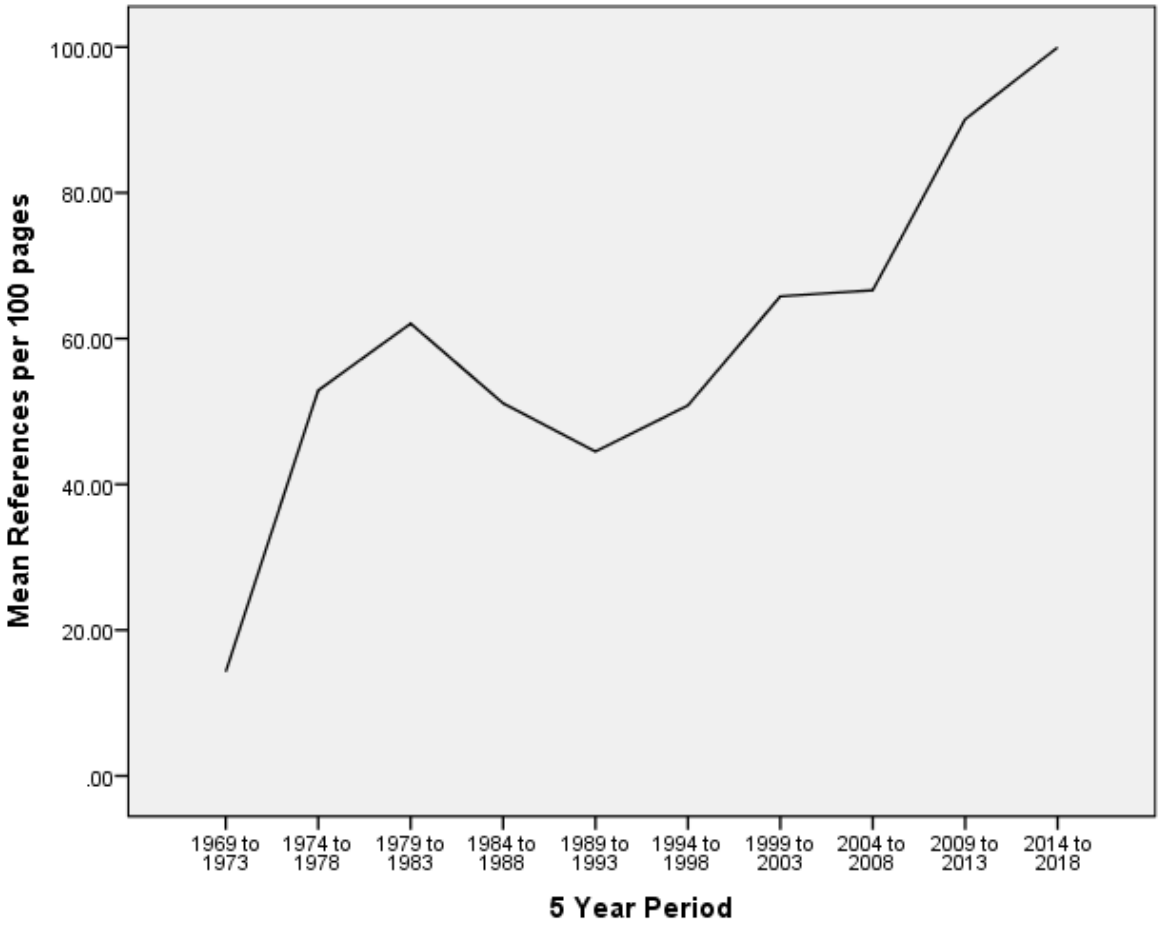

Figure 8: Mean number of references per 100 pages in 5-year periods using raw data.

peak in the mean number of references per 100 pages shifted to the next 5-year time period, i.e., it shifted from the 1974 to 1978 time period to the 1979-1983 time period. The valley after this peak also shifted to the next 5-year time period, i.e., it shifted from the 1984 to 1988 time period to the 1989 to 1993 time period. This indicates that the choice of the unit of analysis (individual reference level vs. book level) makes a difference in some of the finer distinctions in the data but not as much overall.

A scatter plot was created for various time period groupings of data using both raw and summary data. Different fit lines were applied to the graph to determine the best fit as well as to find the amount of variance in the number of references per 100 pages it explained. Table 10 shows the results. In each case, a quadratic fit line explained more variance than a linear fit line and a cubic fit line explained more variance than a quadratic fit line. Using data for all years from 1970 to 2018 improved the amount of variance explained compared to using just the data from pre-1997 years. Using raw data, i.e., all 43,094 references, and plotting it in one year intervals explained the most variance followed by the use of summary data for each edition plotted in one year intervals. Using 5-year groupings explained the least amount of variance. Based on this, the best fit was a cubic fit line using raw data plotted for each single year. This fit line explained 25.4% of the variance in the number of references per 100 pages. Figure 9 shows the fit line. A significant two-tailed Pearson correlation coefficient was found for the relationship between the copyright year and the number of references per 100 pages ($p < .001$).

The advent of the internet affects these results. The graph suggests this which makes logical sense since the internet made more sources readily available to an author. To assess when this effect might have occurred, a regression line, as shown in Figure 10, comparing the

Table 10

r^2 Value for Different Fit Lines of Scatter Plots
Comparing References per 100 Pages to Time Periods

Data Used → Fit Line ↓	Single Year Group, Raw Data, Pre-1997 Years	5-Year Groups, Summary Data, All Years	Single Year Group, Summary Data, All Years	Single Year Group, Raw Data, All Years
Linear	.022	.177	.182	.208
Quadratic	.033	.197	.207	.253
Cubic	.063	.199	.211	.254

copyright year and the number of references per 100 pages was fit to the data using the Loess Fit Method using 50% of points to fit an Epanechnikov kernel. This method weighs data points closest to a point on the fit line more heavily than distant data points. An upward inflection in the graph occurs in the 1997 to 2000 year range and, since 1997 is the first time an internet source was cited in the data, 1997 was used when exploring the fit of a linear regression line. A cubic regression line comparing the references per 100 pages and the copyright year for data before 1997 can be found in Figure 11. This was the best fit for the data. This line explains .063 of the variance in the number of references per 100 pages. A linear and quadratic fit line was also run. The linear regression line's estimate of the number of references per 100 pages equals the copyright year multiplied by 0.41 subtracted from 868. For example, in 1975, the estimate is (1975 x 0.41) - 868 or 58.25 references per 100 pages. With each increase in the year beyond 1970, the number of references per 100 pages decreases 0.41; however, this relationship explains little of the variance in the number of references per 100 pages since the r^2 value equals .022. The r^2 value of the quadratic fit is .033. Overall, none of the fit lines explained much variance.

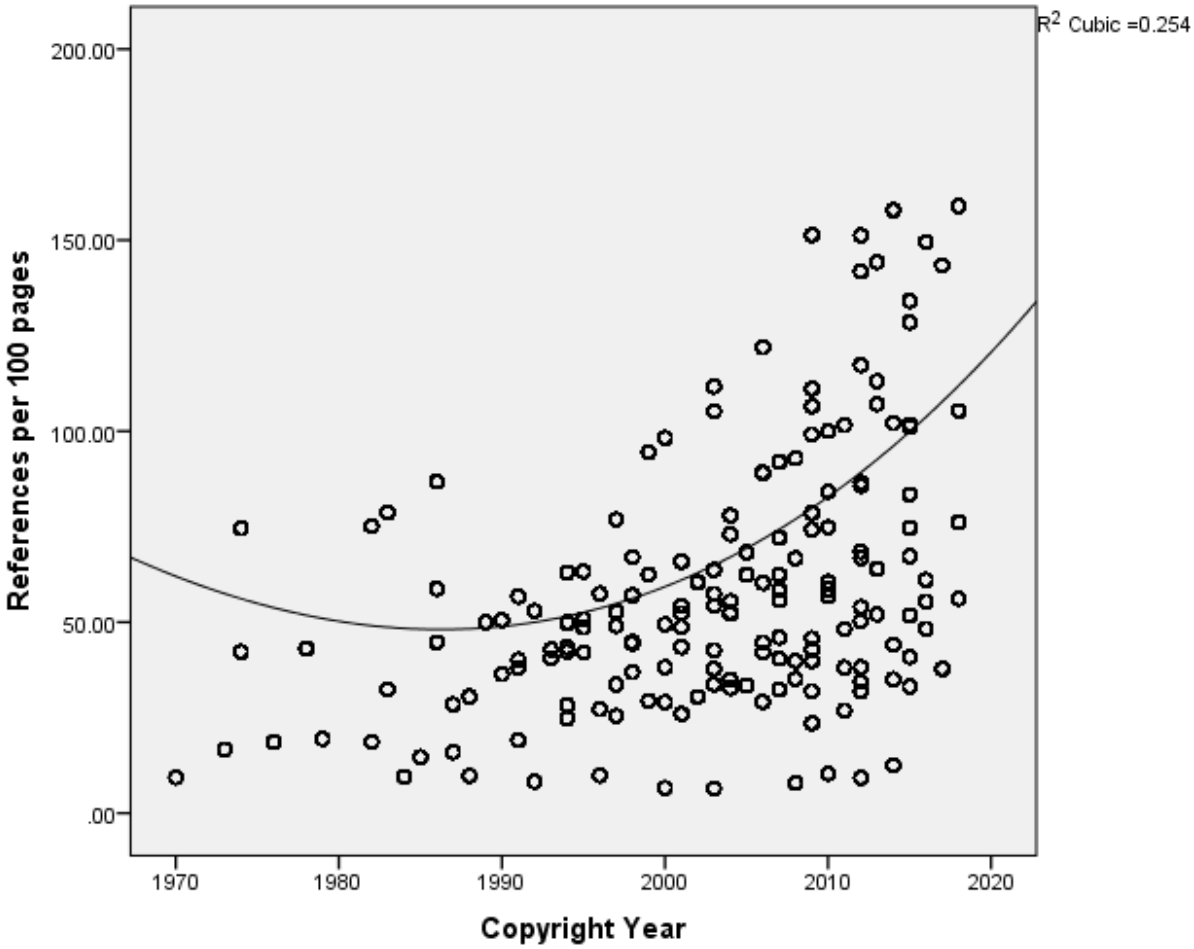

Figure 9: Cubic fit line for the number of references per 100 pages using raw data plotted in one-year intervals for all years.

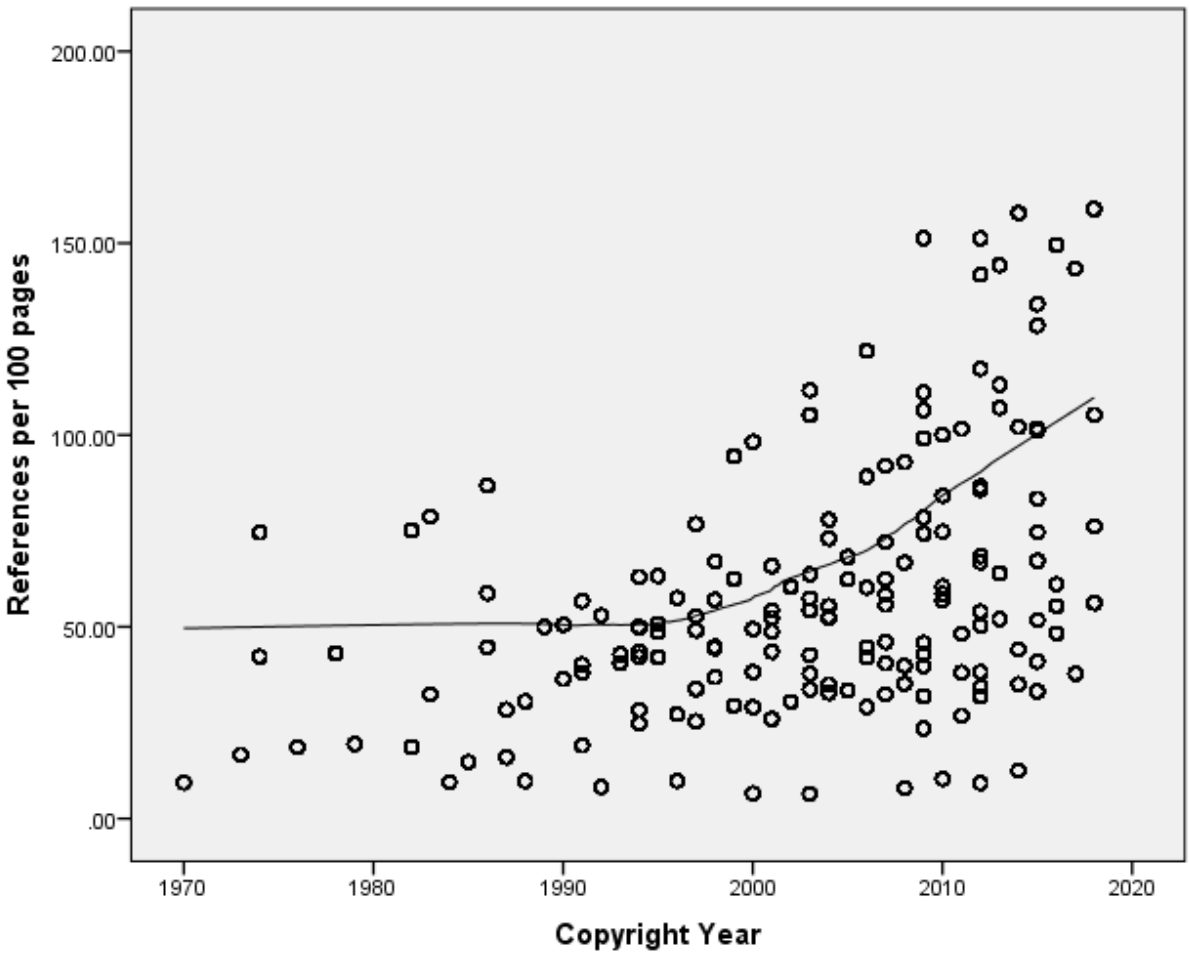

Figure 10: Regression line using Loess fit method for number of references per 100 pages compared by copyright year using raw data and 50% of points to fit an Epanechnikov kernel.

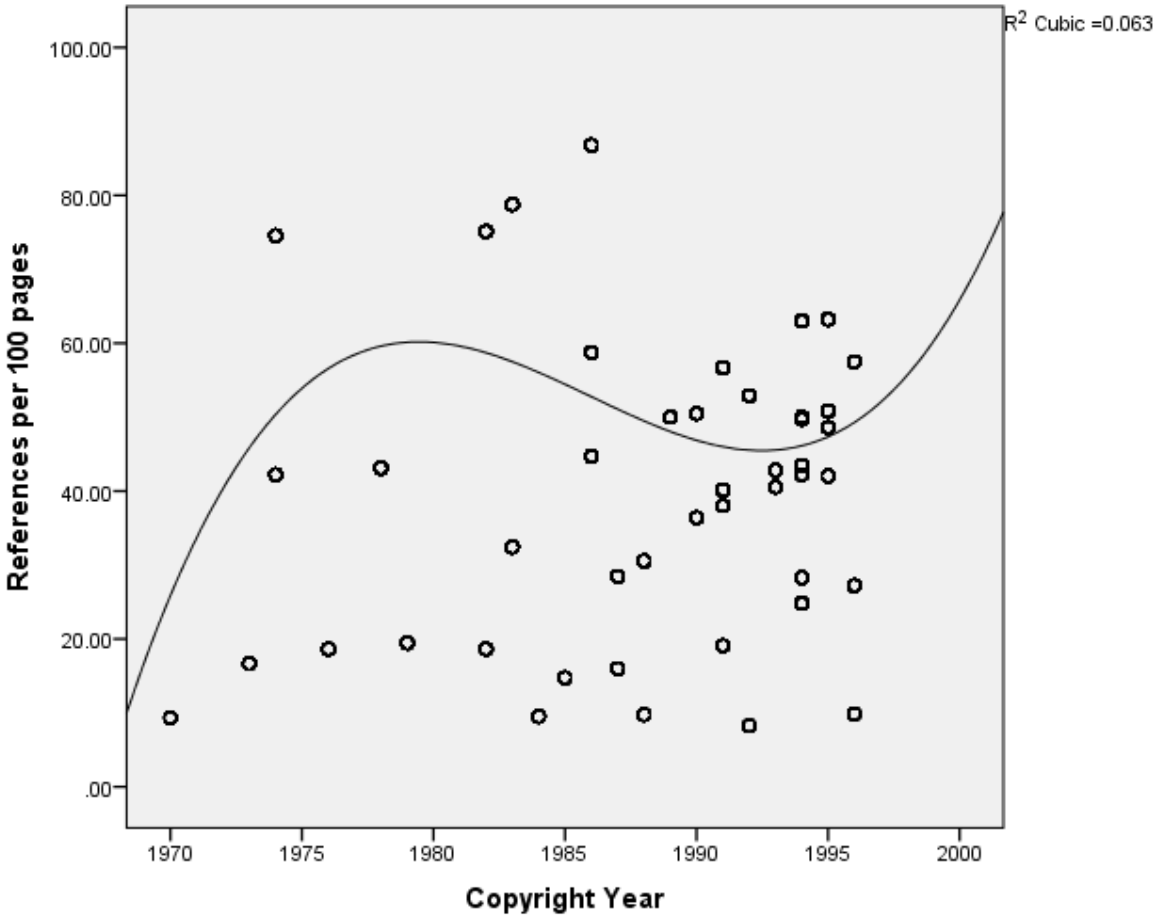

Figure 11: Cubic fit line for the number of references per 100 pages compared to the copyright year using raw data for years before 1997.

As seen in Figure 12, the relationship between the number of references per 100 pages and the copyright year of the book is stronger with 17.7% of the variance explained by a cubic fit regression line when only books published in 1997 or more recently are included in the analysis. A linear fit accounted for 17.3% of the variance and a quadratic fit explained 17.6% of the variance so there was only a small difference between the models. In the linear fit model, the regression line equation equals 2.66 times the copyright year minus 5270, i.e., for each year increase in the copyright year, there are 2.66 more references per 100 pages. For example, for the copyright year 2000, the estimate of the number of references per 100 pages is (2000 x 2.66) – 5270 which equals 50 references per 100 pages.

Two conclusions can be reached at this point. First, before 1997, the copyright year was weakly correlated with the number of references per 100 pages. Second, the weak correlation between the number of references per 100 pages and the copyright year for raw data before 1997 indicates these data should be deleted from the analysis but, when included in the analysis of all years from 1970 to 2018, these data improved the correlation so were kept in the analysis. The variance explained by the cubic fit line improved from 17.7% to 25.4% by this inclusion.

A comparison between editions with footnotes and editions with bibliographies was conducted next. Of the 177 editions, 162 or 91.5% used a bibliography with 15 or 8.5% using footnotes. Four books used footnotes: Devito (5 editions), Hamilton (6 editions), Rothwell (2 editions), and Vrooman (2 editions). The small percentage of editions and titles using footnotes initially suggests little effect on the results. An examination of the distribution in the average number of references for 5-year periods using summary data and showing a line graph for each type (see Figure 13) shows both line graphs have a similar shape but the line is lower for editions

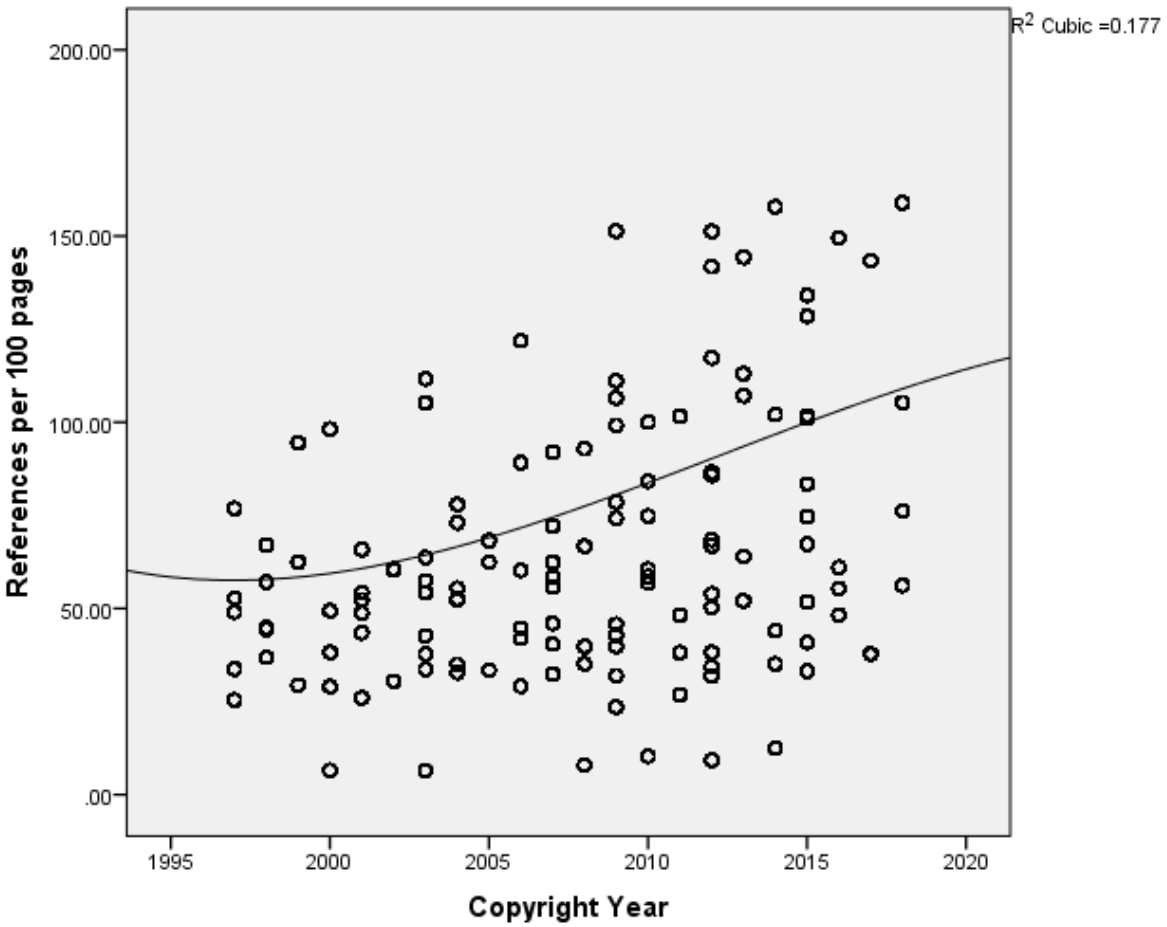

Figure 12: Cubic fit line for the relationship between the number of references per 100 pages and the copyright year using raw data years after 1996.

that used footnotes. The line representing editions with bibliographies also extends across the entire time period while editions using footnotes only extends from the 5-year time period of 1999-2003 to the 5-year time period of 2014-2018. As Figure 14 shows, use of raw data produces similar conclusions except that editions using footnotes shows a more accelerated increase in the number of references per 100 pages.

Editions that used footnotes can be described in other ways as shown in Table 11. First, using summary data, the mean number of references per 100 pages for editions with bibliographies is 54 while the mean for editions with footnotes is 100. Second, the range, as expected with fewer editions, is smaller with editions with footnotes. Although both have a similar maximum (159 for bibliographies and 158 for footnotes), the minimums are much farther apart (6 for bibliographies and 43 for footnotes). Finally, there is more variance in the number of references per 100 pages for footnote users compared to bibliography users (44 vs. 30).

When editions using footnotes versus bibliographies are compared using raw data (Table 12), two of the observations about the differences between the two types were changed. First, the difference between the means increased when raw data were used. This occurred because editions with more references were weighted more heavily in the raw data. Each reference was counted rather than using a single mean to represent the references regardless of their number. More importantly, the standard deviation dropped from 13.5 to 3 when raw data were used. Again this was due to the moderating effect of weighting.

An independent samples t-test was run on summary data to better assess the difference between the means of the two groups. Levene's test for the equality of variances showed that the null hypothesis of equal variance is rejected ($F = 7.083$, $p = 0.009$) and the comparison of means

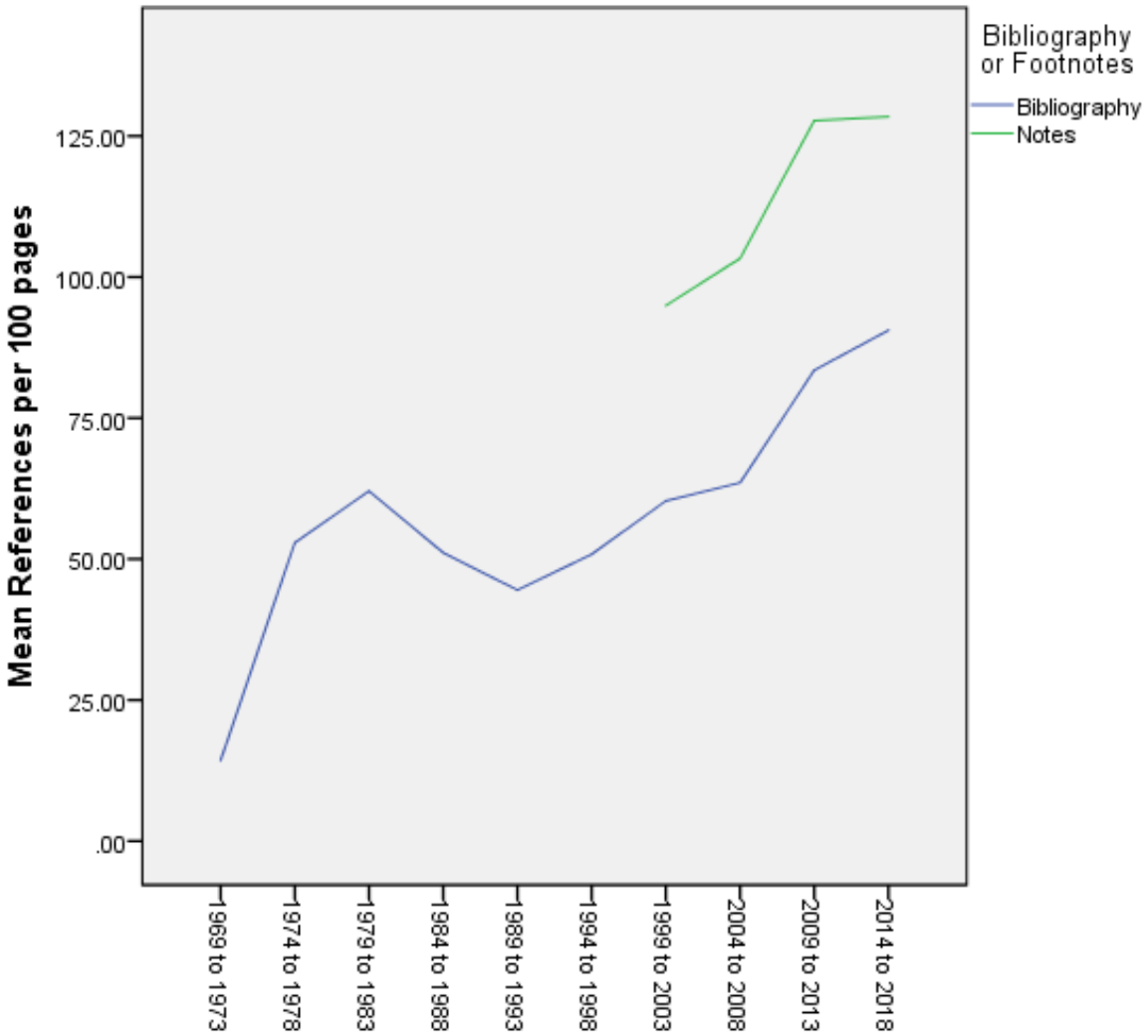

Figure 13: Mean number of references per 100 pages for editions using a bibliography or notes compared to 5-year periods using raw data.

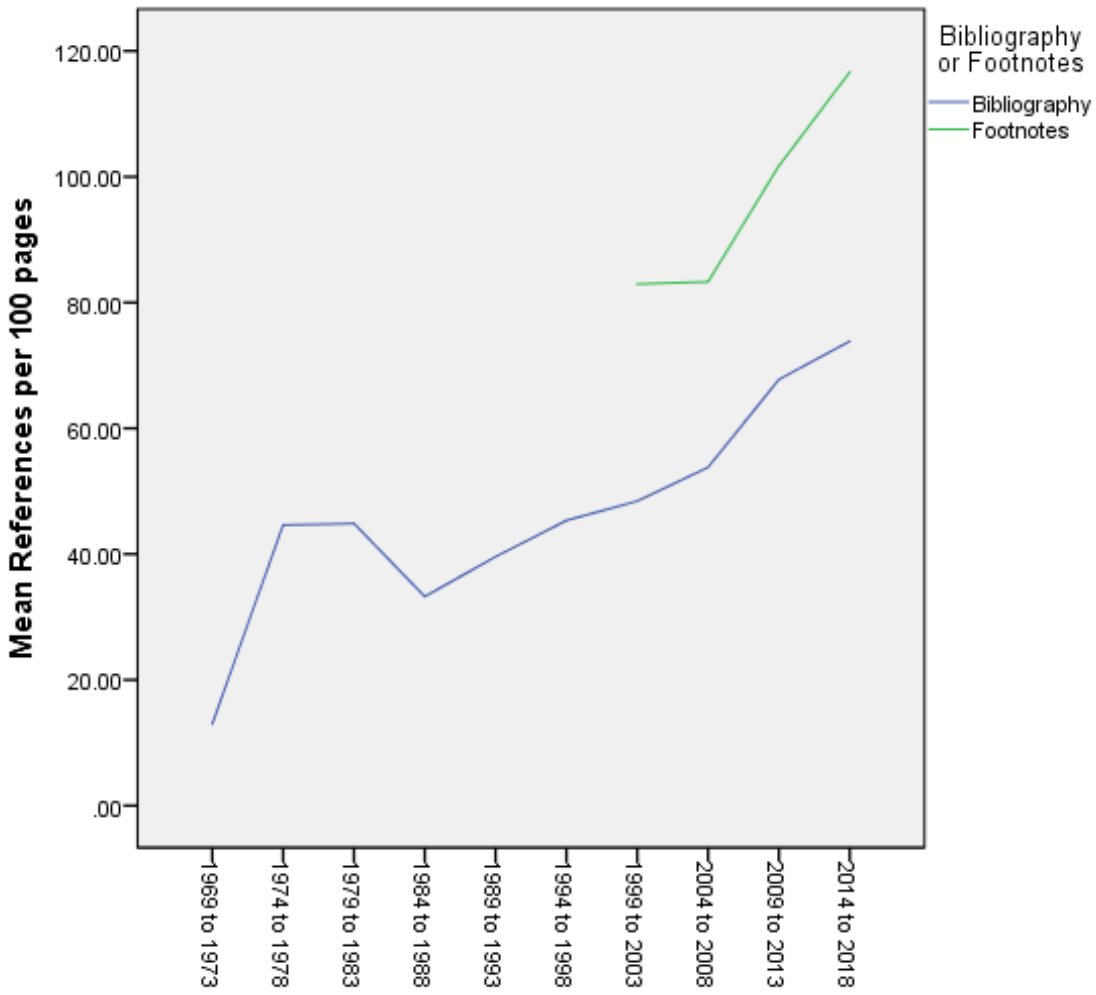

Figure 14: Mean number of references per 100 pages for editions using a bibliography or notes compared to 5-year periods using summary data.

Table 11

Comparison between Editions Using Footnotes and Bibliographies in the Number of References per 100 Pages Using Summary Data

References per 100 pages

Bibliography or Footnotes	N	Mean	Minimum	Maximum	Std. Deviation
Bibliography	162	54.1737	6.24	158.93	30.00685
Footnotes	15	100.5023	42.67	157.88	43.53307
Total	177	58.0999	6.24	158.93	33.79119

Table 12

Comparison between Editions Using Footnotes and Bibliographies in the Number of References per 100 Pages Using Raw Data

Bibliography or Footnotes	N	Mean	Minimum	Maximum	Std. Deviation
Bibliography	37842	69.0605	6.47	158.93	32.27653
Notes	5252	119.1984	42.67	157.88	35.48488
Total	43094	75.1709	6.47	158.93	36.56878

should be based on the assumption of unequal variances. The t-test for this assumption indicates a significant difference between the number of references per 100 pages for editions using footnotes and editions using bibliographies (t = -4.034, df = 15.256, p = .001). The same conclusion was reached using raw data. Levene's Test for equality of variance was significant (F = 93.851, p < .001) and the comparison of means based on the assumption of unequal variance was significant (t = -96.980, df = 6514.210, p < .001).

Although means are significantly different, there is a significant correlation between the number of references per 100 pages for editions with footnotes and editions with bibliographies. The correlation between the two equals 0.383. Squaring this value gives an r^2 value of .147, i.e., 14.7% of the variance in the number of references per 100 pages is explained by whether a bibliography was used or footnotes. The t-test showed a significant relationship (p < .001) and the correlation shows a small relationship based on Cohen's (1988) classification of effect sizes. When raw data were used and 43,094 data points were used in the analysis, the correlation rose to .449, thus explaining 20.2% of the variance in the number of references per 100 pages.

Research Question #2

To what extent does the average age (mean and median) of references used in subsequent editions of United States, national edition, introductory, college, public speaking textbooks change? An inspection of Table 13 that lists mean and median age of references in various editions shows a trend involving an increase in average age as the edition of a title from the first to seventh edition but a consistent decrease in average age from the seventh to eleventh edition. Across all editions, no clear pattern emerges. Figure 15 and 16 present the data graphically for the mean and median of each edition.

Table 13

Mean and Median Age of References by Edition

Edition	Number of Books	Mean Age of References	Median Age of References
1	25	14.368	14.000
2	26	15.932	15.250
3	22	15.214	15.200
4	18	15.122	14.650
5	16	16.113	15.200
6	15	16.722	14.900
7	13	17.069	17.300
8	9	16.067	16.600
9	7	15.314	12.800
10	6	13.233	13.300
11	4	13.175	13.000
12	4	15.425	14.300
13	3	15.633	11.700
14	3	19.200	15.200
15	2	17.750	17.750
16	2	18.350	18.350
17	2	19.150	19.150
Total	177	15.658	14.800

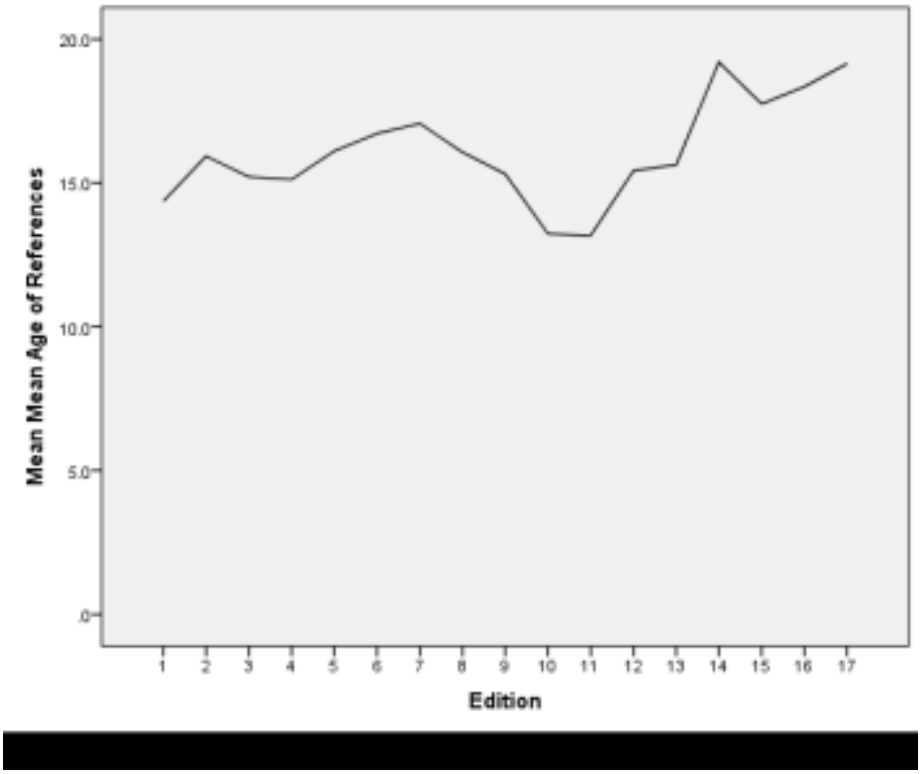

Figure 15: Mean of the mean age of references by edition.

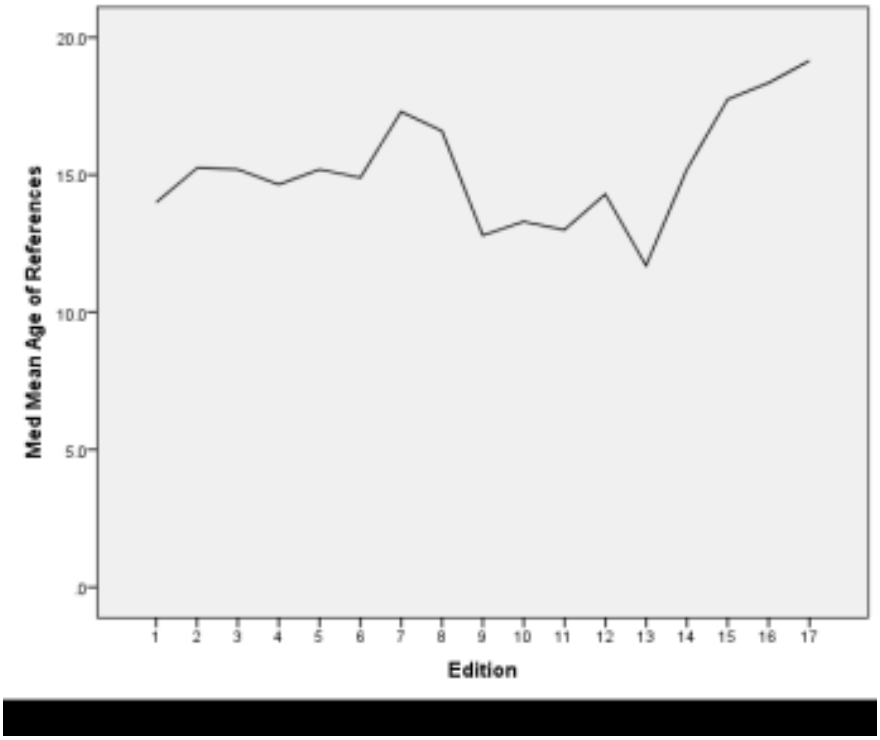

Figure 16: Median of the mean age of references by edition.

A linear regression analysis comparing the relationship between the individual ages of all 43,094 references in books and the edition of the book shows that little of the variance in the age of references is explained by the edition (r^2 = .002). Figure 17 shows the simple scatter plot with regression line. A quadratic fit line explains the same amount of variance (r^2 = .002) while a cubic fit line explains slightly more (r^2 = .003). The added complexity of a cubic fit line did not justify its use as an appropriate model given the marginal increase in variance explained. The problem with using the raw data for this analysis is that it puts extra weight on data from titles with more references and the concern with this research question is with the edition as the unit of analysis, not with the individual reference. However, librarians would be interested in the results using raw data because they are concerned with the availability of references used to write a book.

A stronger relationship is identified if the mean reference age for each of the 177 books is used instead of the raw data consisting of all the individual references. Both a linear fit line and a quadratic fit line produced an r^2 value of .009. A cubic fit line produced an r^2 value of .025 which is a noticeable improvement in fit although still explaining little variance. This graph is shown in Figure 18. The correlation between the mean reference age and the edition for all books was nonsignificant (p = .205). Assuming that access to the internet may make it easier to update references, the data were limited to editions published after 1996. Little variance was explained by a linear, quadratic, or cubic fit with the cubic fit explaining the most variance with an r^2 value of .009. Once again, the two-tailed Pearson correlation coefficient found the relationship between the mean age of references and the edition for post-1996 editions to not be significant (p = .730).

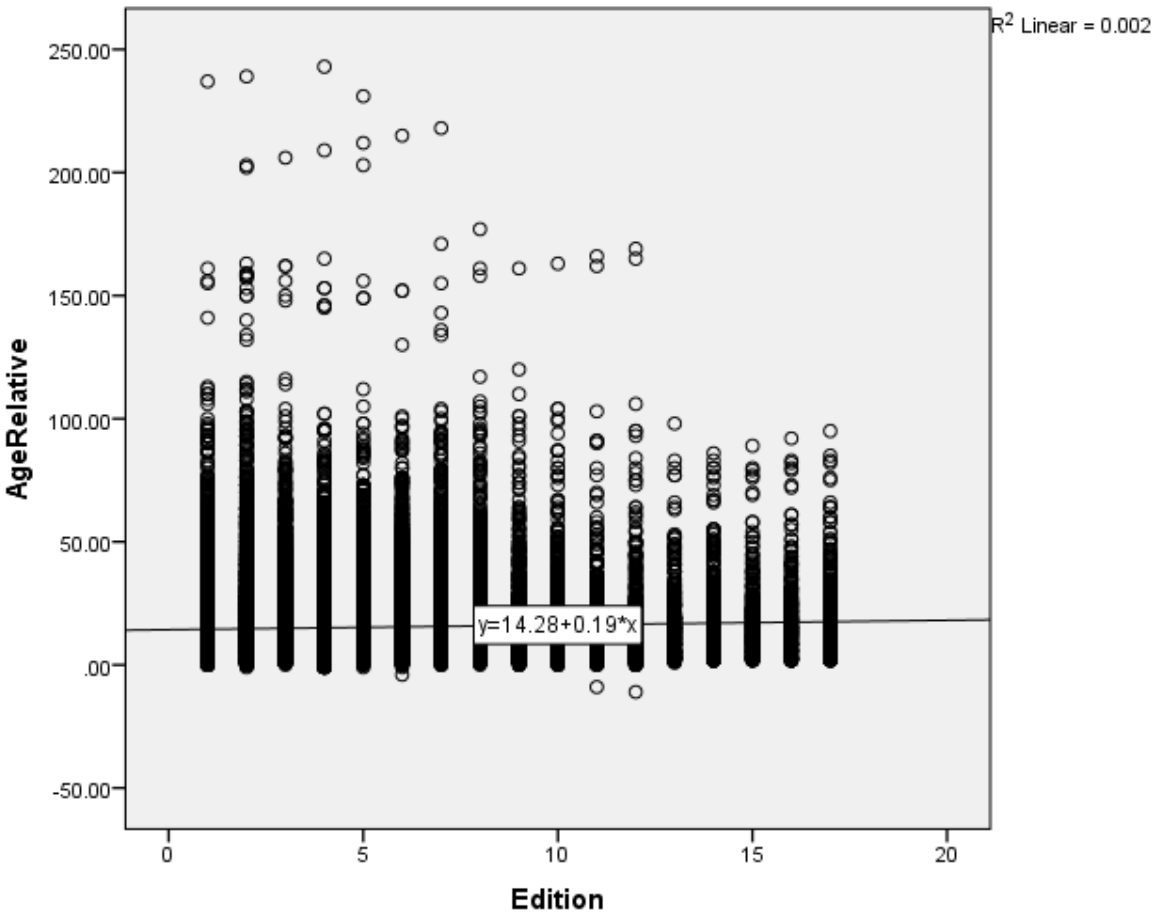

Figure 17: Linear relationship between the relative age of all references and the edition using raw data.

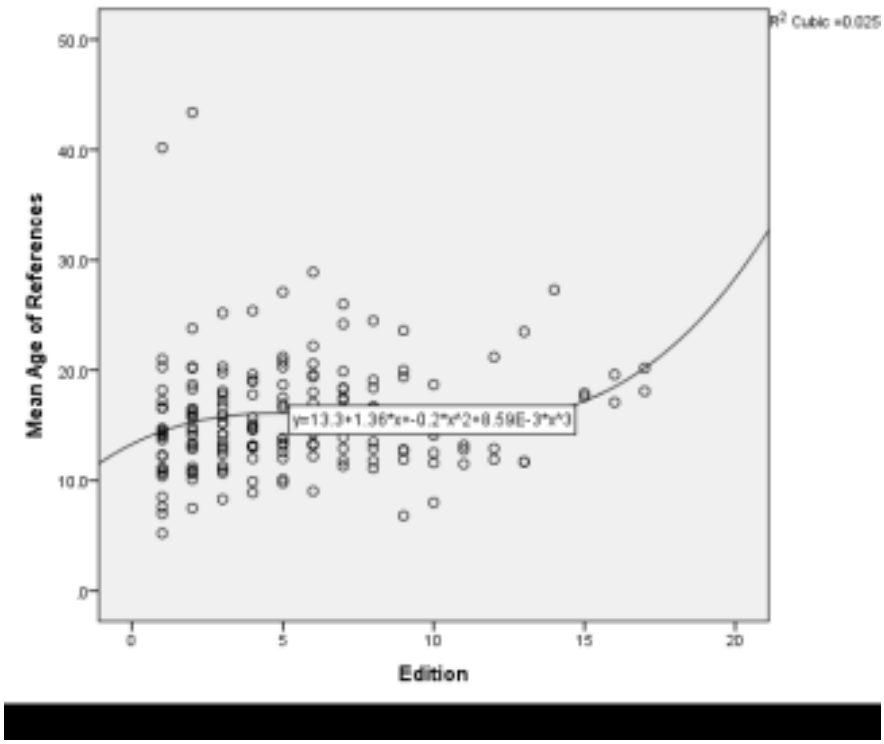

Figure 18: Cubic relationship between the mean age and the edition using summary data.

In contrast to the relationship between the edition and the average age of references, there is a clearer and stronger relationship between the copyright date and the average age of references. Data, as shown in Table 14, in this case were grouped into five-year intervals to increase the number of cases in each category. After an initial increase in the mean and median number of references, the trend line shows some ups and downs before consistently increasing from the 1994-1998 interval to the 2014-2018 interval. The median was calculated in case an extreme case biased the results. Figure 19 and 20 show these data graphically.

One possible confounding variable in this analysis is the mean edition number of each time period. A time period with numerous first and second editions might have a lower relative age of references since authors may neglect updating their references with each subsequent edition. Table 15 shows the distribution in the mean edition number across five-year periods. Except for the 1969 to 1973 time period that only had two editions, the data do not indicate there is a pattern of bias in the distribution of editions.

To determine if there is a significant difference between the ages of references across all 177 editions, an ANOVA test was conducted. Before running the analysis, however, two new variables were created. First, a unique code was created for each edition. The code consisted of multiplying 100 by the number assigned to each title which ranged from 1 to 28 and adding the edition to this number. For example, textbooks by Jaffee are alphabetically the 4^{th} title examined in this research so this number was multiplied by 100 to get 400. The unique codes for the eight editions written by Jaffee were calculated to be 401 through 408. Codes ranged from 101 for Beebe and Beebe's first edition to 2907 for Zarefsky's last edition. Second, the absolute age of a reference was converted into a relative age by subtracting the absolute age of the reference from

Table 14

Mean Age of References by Five-Year Intervals Using Summary Data

5-Year Period	N	Mean	Median
1969 to 1973	2	6.350	6.350
1974 to 1978	4	13.450	13.700
1979 to 1983	5	11.940	10.800
1984 to 1988	9	13.978	14.100
1989 to 1993	11	13.409	13.000
1994 to 1998	24	13.184	12.850
1999 to 2003	26	15.290	14.600
2004 to 2008	31	16.571	15.800
2009 to 2013	40	17.352	16.700
2014 to 2018	25	18.008	18.000
Total	177	15.658	14.800

Table 15

Distribution and Mean of the Edition Number Across Five-Year Periods

5-Year Period	N	Mean
1969 to 1973	2	1.50
1974 to 1978	4	5.25
1979 to 1983	5	5.00
1984 to 1988	9	4.11
1989 to 1993	11	3.55
1994 to 1998	24	4.75
1999 to 2003	26	4.54
2004 to 2008	31	5.97
2009 to 2013	40	6.40
2014 to 2018	25	5.68
Total	177	5.31

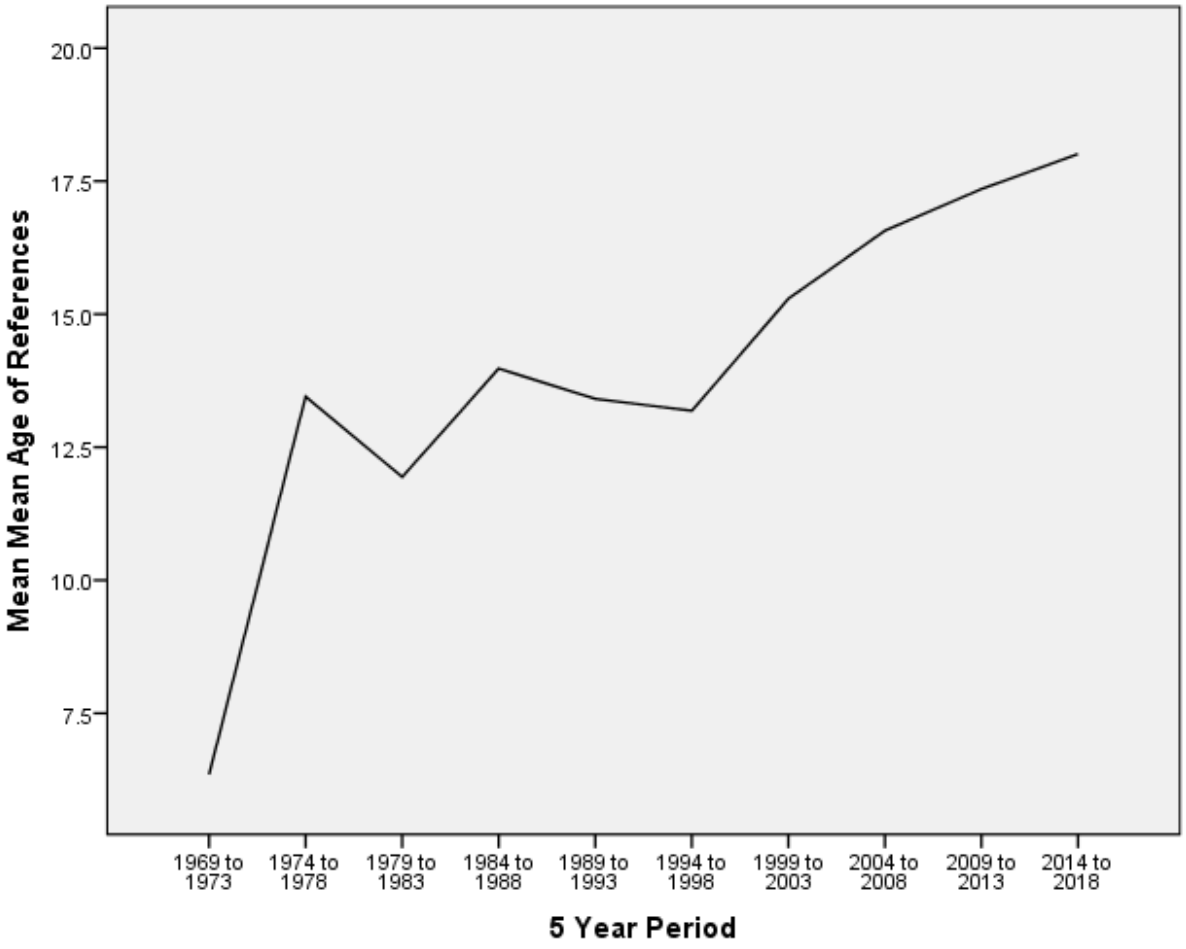

Figure 19: Means of the mean age of references by 5-year intervals using summary data.

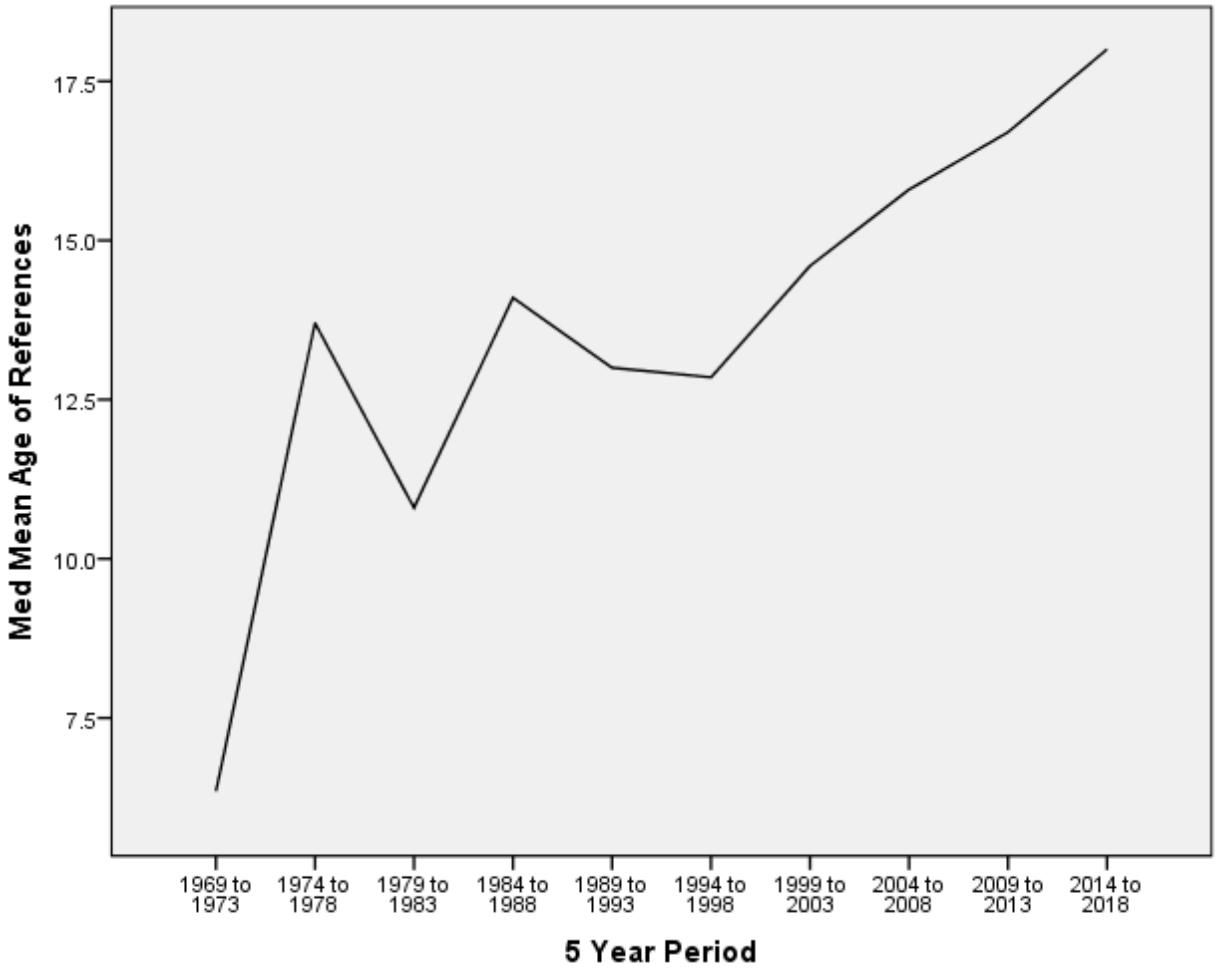

Figure 20: Medians of the mean age of references for 5-year intervals using summary data.

the copyright date of the edition.

ANOVA tests comparing the age of references to individual editions of a title, to all the editions of a title, to the edition, and to the time period of the edition all showed significant differences. Before the tests were conducted, the data were tested for homogeneity of variance using Levine's test. Since Levine's test cannot be computed for more than 50 groups, the data were divided into four groups. The first group consisted of the first 44 unique editions, the second group comprised the next 50 unique editions, the third group constituted the next 50 unique editions, and the final group was made of the final 31 unique editions. In each case, Levene's test was significant ($p < .001$) indicating there was not homogeneity in the variances in the ages of references across unique editions. As a result, robust tests of the equality of means were used, specifically the Welch and Brown-Forsythe tests. The results show significant differences in the variance in relative age of references across editions, $F(16, 5169.133) = 14.381$, $p < .001$for the Welch test and $F(16, 14695.171) = 14.016$, $p < .001$ for the Brown-Forsythe test.

Next an ANOVA was conducted between the relative age of references and the copyright year using raw data. Levine's test indicated there was not homogeneity of variance so the Welch and Brown-Forsythe robust tests of equality of means were used. Both tests found significant variance in the relative age of references across time, $F(42, 2665.715) = 17.240$, $p < .001$ for the Welch test and $F(42, 13376.938) = 16.959$, $p < .001$ for the Brown-Forsythe test.

A scatter graph was created to further assess the relationship between the average age of the references in an edition and the copyright year of the edition. The relationship was conducted using individual years and 5-year periods as well as evaluated using linear, quadratic, and cubic

fit lines. For the evaluation done with individual years, the linear fit produced an r^2 value of .147, the quadratic fit resulted in an r^2 value of .148, and the cubic fit equaled .148. Given the small improvement in the variance explained, the simpler, linear model was the best choice. Figure 21 shows this graph. A Pearson correlation coefficient was calculated between the average age and the copyright year and found to be statistically significant ($p < .001$). Graphs using 5-year periods produced lower r^2 values of .144 for the linear fit, .145 for the quadratic fit, and .146 for the cubic fit. These proved to be an equally significant relationship ($p < .001$).

Another aspect to the second research question involves the extent that the distribution in the age of references changed in subsequent editions. Table 16 shows the distribution in the age of references for five-year periods up to 50 years of age. The period 1969 to 1973 is an anomaly in the data since 60.3% of references were 0 to 5 years old in this period whereas, at most in any other time period, references that were less than 6 years old equaled 33.7% of the total. This anomaly occurred because only two editions fell into this time period and both were written by Verderber who used few references in his early editions (24 in the 1st edition and 48 in the 2nd). For the remaining time periods, about 25% of references are no more than 5 years old with a range of 23.3% to 33.7%. About 50% are no more than 10 years old with a range from 43.1% to 58.0%. About 65% are no more than 15 years old with a range from 59.4% to 70.1%. Approximately 75% are within 20 years old with a range from 70.1% to 77.4%. References no older than 25 years are around 80% of the total with a range from 77.3% to 82.7%. References no older than 30 years old added up to about 85% of references with a range of 80.6% to 86.9%. No obvious pattern is evident upon inspection but a chi-square analysis of the table with the 1969 to 1973 data excluded found significant differences, χ^2 (80, N = 43,026) = 975.561, $p < .001$.

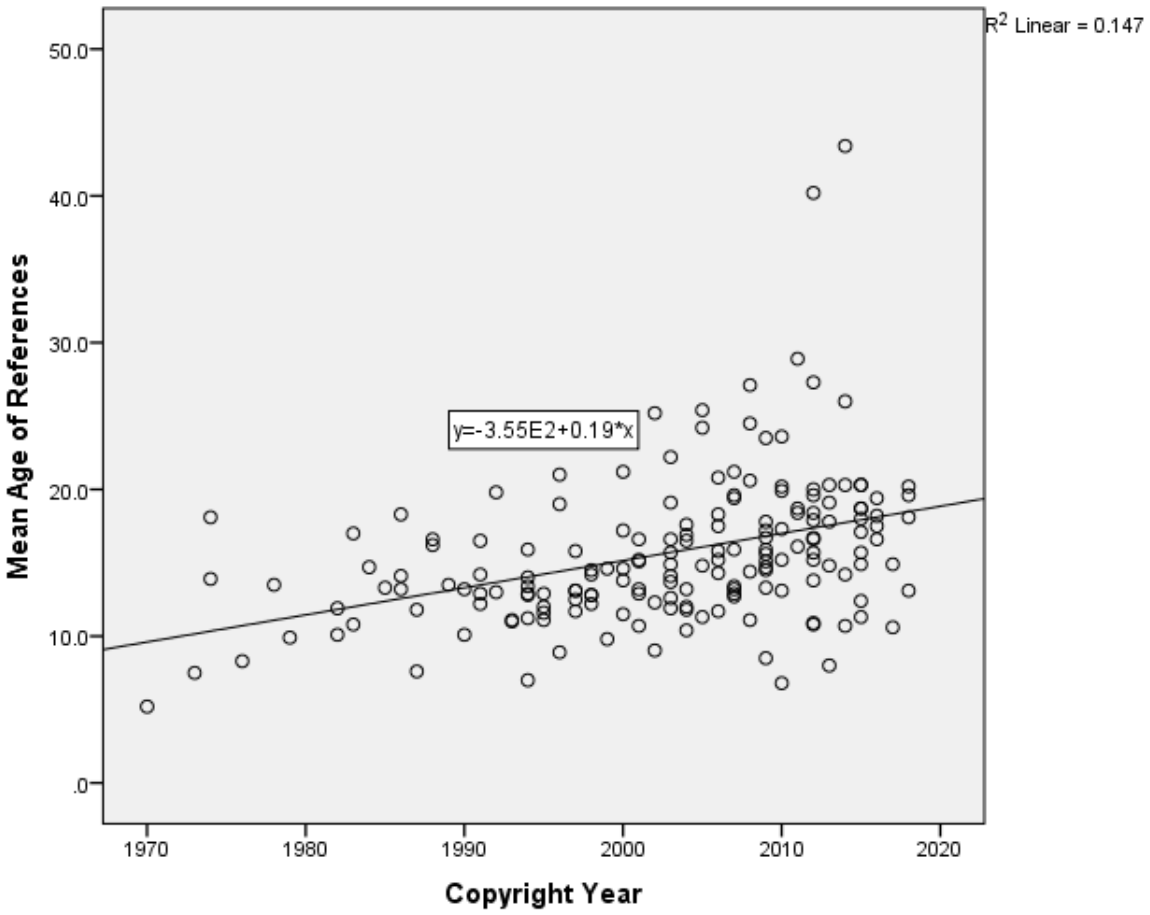

Figure 21: Mean age of references compared to the copyright year using summary data.

A Pearson Correlation, however, found the relationship explained only 0.2% of the variance between the two variables. The large sample size explains the significant results.

Table 16

Distribution in the Age of References Across Five-Year Time Periods

	5 Year Period									
Age	1969 to 1973	1974 to 1978	1979 to 1983	1984 to 1988	1989 to 1993	1994 to 1998	1999 to 2003	2004 to 2008	2009 to 2013	2014 to 2018
0 to 5	60.3%	26.0%	33.8%	23.7%	31.7%	33.7%	25.0%	23.3%	24.1%	24.4%
0 to 10	63.2%	48.5%	51.3%	48.4%	57.5%	58.0%	50.0%	43.1%	44.3%	44.5%
0 to 15	73.5%	62.1%	65.7%	62.2%	70.1%	70.5%	67.7%	61.8%	59.5%	59.4%
0 to 20	79.4%	71.4%	75.3%	73.2%	77.1%	77.4%	76.7%	73.7%	71.7%	70.1%
0 to 25	80.9%	77.3%	81.8%	80.3%	82.7%	82.2%	81.7%	79.9%	79.6%	78.8%
0 to 30	80.9%	80.6%	86.0%	85.3%	86.9%	86.6%	85.5%	83.7%	83.9%	84.8%
0 to 35	80.9%	83.3%	87.9%	88.1%	89.4%	89.5%	89.1%	86.5%	86.6%	87.6%
0 to 40	80.9%	85.8%	88.7%	89.8%	98.5%	91.4%	91.6%	89.6%	88.9%	89.5%
0 to 45	82.5%	87.7%	90.0%	90.5%	99.4%	92.9%	93.1%	91.7%	91.3%	91.3%
0 to 50	83.9%	89.5%	91.1%	91.4%	99.6%	93.5%	94.4%	93.0%	92.7%	93.0%

Research Question #3

To what extent does the type of reference used in subsequent editions of United States national edition introductory college public speaking textbooks change? References were classified as books, chapters in books, conference papers, dissertations, internet web pages, journals, newsletters, newspapers, and other categories. For all but the internet web pages, chapters, and newsletters, if the reference was of the type listed but found on the internet, a separate category was created for each internet version of a book, chapter, conference paper,

dissertation, journal, newsletter, newspaper or other category, e.g., internet book. No chapters or newsletters were found on the internet so the category of internet chapter or internet newsletter was not used. Table 17 shows how frequently each type of reference was used.

An inspection of Table 17 shows the use of some types of references to be so small as to not warrant additional individual investigation. Any type of reference that was less than 2% of all references was treated this way. Of the 42,843 references coded, only 99 were for books found on the internet. This number equals 0.2% of the total number of references. Conference papers were referenced 54 times, equaling 0.1% of all references. Conference papers found on the internet was an even smaller number, equally 18 references and a percent of all references less than 0.1%. References to dissertations occurred 78 times or in 0.2% of all references. Journal articles found on the internet added up to 103 of the references or 0.2% of the total. Magazine articles found on the internet were referenced 451 times for 1% of the total number. Newsletters constituted 136 of the references studied or 0.3% of the total. Other information found on the internet occurred 7 times or less than 0.1% of the total.

Data for infrequently cited references were combined with other reference categories. The analysis of books included books found on the internet, chapters of books, and chapters found on the internet. The analysis of journals included journal articles found on the internet. Magazine articles found on the internet and magazines were combined for this research. References coded as newspapers found on the internet were combined into the newspaper category. Several categories were merged into the “other” category including conference papers, conference papers found on the internet, newsletters, and other internet materials. Table 18 shows the frequencies for these combined categories while Table 19 shows pre-1997 data only.

Table 17

Frequencies for Different Types of References

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Book	16285	37.8	38.0	38.0
	Book, internet	99	.2	.2	38.2
	Chapter	1785	4.1	4.2	42.4
	Conference Paper	54	.1	.1	42.5
	Conference paper, internet	18	.0	.0	42.6
	Dissertation	78	.2	.2	42.8
	Internet	4311	10.0	10.1	52.8
	Journal	10127	23.5	23.6	76.5
	Journal, internet	103	.2	.2	76.7
	Magazine	4105	9.5	9.6	86.3
	Magazine, internet	451	1.0	1.1	87.3
	Newsletter	136	.3	.3	87.7
	Newspaper	1752	4.1	4.1	91.7
	Newspaper, internet	531	1.2	1.2	93.0
	Other	3001	7.0	7.0	100.0
	Other, internet	7	.0	.0	100.0
	Total	42843	99.4	100.0	
Missing	System	251	.6		
Total		43094	100.0		

Table 18

Frequencies for Combined Categories of References

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Books	18169	42.2	42.4	42.4
	Internet	4311	10.0	10.1	52.5
	Journals	10230	23.7	23.9	76.3
	Magazines	4556	10.6	10.6	87.0
	Newspapers	2283	5.3	5.3	92.3
	Other	3294	7.6	7.7	100.0
	Total	42843	99.4	100.0	
Missing	System	251	.6		
Total		43094	100.0		

Table 19

Frequencies for Combined Categories of References in Pre-1997 Books

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Books	4009	52.3	52.6	52.6
	Journals	1465	19.1	19.2	71.8
	Magazines	985	12.9	12.9	84.7
	Newspapers	203	2.6	2.7	87.4
	Other	961	12.5	12.6	100.0
	Total	7623	99.5	100.0	
Missing	System	39	.5		
Total		7662	100.0		

An inspection of the table shows books are the most used reference material followed by journals, magazines, the internet and other sources. The same pattern nearly emerges if the data are not combined except that the ranking of internet sources and magazines flips when the data are not combined. With the combined data, magazines are 10.6% of references and the internet is 10.0% of sources but when the data are not combined, internet sources are used more frequently than magazines (10.0% vs. 9.5%).

The data on the number of internet sources are misleading since the internet did not exist during the entire time span of this study (1970 to 2018). The next step taken in the data analysis, then, revealed that 1997 was the first year that the internet was cited in any form so the data were divided into pre-1997 cases and cases including 1997 and beyond. Table 19 shows the data for pre-1997 cases, and Table 20 shows the data for cases beginning 1997 and more recent.
The table for pre-1997 data shows a much larger role for books, magazines, and other sources but a decreased use of journals and newspapers when writing introductory public speaking textbooks for the college audience when compared to the data for all years combined. Across all years, books equaled 42.2% of all references but pre-1997 books were 52.6% of the total. Magazines were referenced 10.6% of the time across all years but constituted 12.9% of references pre-1997. Other types of references also saw an increase in the pre-1997 period compared to all time periods studied with an increase from 7.6% in all time periods to 12.6% in the early time period. On the other hand, journals dropped from 23.7% of references in all time periods to 19.2% in the pre-1997 period while newspapers dropped from 5.3% of the total number of references to 2.7% of the total in the earlier time frame. The implication of these findings is that book, magazine, and other references are used more in pre-internet years while in

Table 20

Frequencies for Combined Categories of References in Post-1996 Books

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Books	14160	40.0	40.2	40.2
	Internet	4311	12.2	12.2	52.4
	Journals	8765	24.7	24.9	77.3
	Magazines	3571	10.1	10.1	87.5
	Newspapers	2080	5.9	5.9	93.4
	Other	2333	6.6	6.6	100.0
	Total	35220	99.4	100.0	
Missing	System	212	.6		
Total		35432	100.0		

post-internet years, journals and newspapers were accessed more as, of course, were internet materials.

The Welch and Brown-Forsythe tests confirm the previous analysis that books, magazines, and other references were used less frequently in public speaking books after 1996 compared to pre-1997 books. Books, as a percentage of the total number of references, dropped from 52.6% to 40.0%. Magazines decreased from 12.9% to 10.1% of the total. Other sources went from 12.6% to 6.6% of all references. On the other hand, the use of journal articles increased from 19.2% to 24.7% of the total and the use of newspapers rose from 2.7% to 5.9%. Internet sources equaled 12.2% of references on average in books published in 1997 or more recently.

An additional issue in this analysis is that internet materials are included in all the combined categories. For example, the category for books includes books found on the internet. To better compare the use of internet and non-internet references, the internet materials were

removed from the combined categories and added to the internet category. Table 21 shows the frequencies of different types of references when this reshuffling is conducted. As before, this analysis is only conducted on books published in 1997 or later.

Little change occurred in the percentages associated with each reference type when internet documents of the reference type are excluded. The internet category increased from 12.2% to 15.7% with most of the increase coming from the newspaper and magazine categories. Newspapers decreased from 5.9% to 4.4% of total references while magazines dropped from 10.1% to 8.9% of the total. As an analysis of Table 17 would also confirm, there are a small percentage of references that are internet books, magazine articles on the internet, conference papers on the internet, or internet newspaper articles. Since there were only small changes in the percentages associated with each reference type regardless of which category internet documents were place, the implications is that this classification choice has little consequence for conclusions about the usage of each category.

Table 21

Frequencies for Post-1996 Reference Categories with Internet References Combined

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Books	14061	39.7	39.9	39.9
	Internet	5520	15.6	15.7	55.6
	Journals	8662	24.4	24.6	80.2
	Magazines	3120	8.8	8.9	89.0
	Newspapers	1549	4.4	4.4	93.4
	Other	2308	6.5	6.6	100.0
	Total	35220	99.4	100.0	
Missing	System	212	.6		
Total		35432	100.0		

Readers might be tempted to conclude from the preceding data that the internet made it easier to identify relevant journal and newspaper articles while the use of books did not benefit as much from the emergence of the internet because they were not as extensively indexed there. Such a conclusion would not be well grounded. First, the drop in the citation of magazine articles

To assess whether authors have similar preferences for the types of references they use, a comparison of individual titles was made for editions published in 1997 or more recently. All internet references were included in the internet category for this analysis. Table 22 shows the distribution for each title. Results of a chi-square test on the table indicate a significant difference in the use of different categories of references by authors ($\chi^2 = 10050.207$, $df = 135$, $p < .001$). Looking over Table 22, the finding of significant differences is not surprising. For example, the percentage of references to books ranges from 19.5% to 77.2% and to journals, the percentage ranges from 1.7% to 53.7%.

The results from the analysis of the most recent editions of the 28 titles again show significant differences between authors for recent editions compared to the combined data of all editions since 1996. The copyright date of the most recent edition ranged from 2005 to 2018. Table 23 lists the number of editions in each year and Table 24 shows the distribution in types of references used by authors for the most recent edition. Chi-square results indicate there are significant differences in the type of references for these most recent editions ($\chi^2 = 2657.238$, $df = 135$, $p < .001$). Once again, perusing the table of data (Table 24), the finding of significant differences is not surprising. For example, the percentage of references to books ranges from 17.5% to 65.5% and to journals, the percentage ranges from 3.2% to 57.2%.

Table 22

Post-1996 Author Use of Different Categories of References

		Books	Internet	Journals	Magazines	Newspapers	Other
Primary Author	Beebe	44.2%	9.9%	24.8%	7.3%	9.6%	4.1%
	Brydon	49.3%	14.1%	16.2%	4.3%	7.6%	8.6%
	Coopman	19.5%	20.8%	53.7%	2.5%	2.7%	0.9%
	Devito	61.6%	4.4%	22.9%	8.1%	0.0%	3.0%
	FordBrown	77.2%	10.5%	2.6%	1.8%	0.0%	7.9%
	Foss	47.7%	25.0%	9.8%	5.3%	4.2%	8.0%
	Fraleigh	30.6%	27.6%	29.5%	3.1%	5.4%	3.8%
	Gamble	42.3%	10.0%	19.4%	10.3%	13.1%	4.9%
	Gregory	22.1%	22.6%	9.7%	15.5%	7.0%	23.0%
	Grice	58.2%	12.0%	6.4%	12.6%	1.6%	9.3%
	Griffin	46.3%	18.8%	27.8%	2.0%	3.5%	1.5%
	Hamilton	39.1%	9.0%	32.5%	14.8%	2.8%	1.8%
	Hogan	41.4%	22.8%	22.8%	6.3%	3.0%	3.7%
	Jaffee	26.7%	25.6%	24.5%	8.9%	2.9%	11.4%
	Lucas	63.5%	3.6%	18.0%	4.5%	4.3%	6.2%
	Metcalfe	27.6%	2.9%	5.2%	20.0%	12.7%	31.7%
	Monroe	56.8%	10.9%	14.4%	11.3%	2.7%	3.9%
	OHareRubenstein	38.8%	23.8%	27.2%	4.4%	1.9%	3.9%
	OHareStewart	44.0%	19.7%	25.6%	5.6%	1.5%	3.6%
	Osborn	37.4%	14.8%	21.1%	17.2%	5.6%	3.9%
	Ross	41.5%	0.2%	48.3%	1.9%	3.3%	4.7%
	Rothwell	29.9%	34.6%	22.8%	3.7%	7.8%	1.3%
	Sellnow	48.5%	3.8%	37.8%	5.5%	2.2%	2.2%
	Sprague	44.8%	6.1%	1.7%	21.0%	3.9%	22.7%
	Valenzano	28.0%	60.7%	6.2%	0.4%	0.8%	3.9%
	Verderber	43.0%	17.2%	20.6%	13.6%	0.2%	5.3%
	Vrooman	36.1%	18.2%	33.9%	2.4%	0.3%	9.0%
	Zarefsky	49.1%	0.9%	45.4%	1.2%	2.7%	0.7%
Total		39.9%	15.7%	24.6%	8.9%	4.4%	6.6%

Table 23

Distribution in the Date of the Last Edition of Each Title

Year	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number	1	2	1	3	2	3	8	3	2	3

The results from the analysis of the most recent editions of the 28 titles also show a greater use of internet references for recent editions compared to the combined data of all editions since 1996. A comparison of Table 22 to Table 24 found, for the most recent editions, internet references equaled 21.6% of all references which is up from 15.7% of all references when data since 1996 are included. References to journals also increased from 24.6% for all editions since 1996 to 27.6% in the most recent editions. There were decreases in the other reference categories for the most recent editions as compared to the combination of all editions from 1996 onward. Books dropped from 39.9% to 35.3% of references, magazines decreased from 8.9% of the total to 5.5%, newspapers went from 4.4% to 4.0% and the other category of references dipped from 6.6% to 6.1%.

Regardless of how many editions are used in the analysis, no consensus exists among authors as to the proper mix to use of different categories of references in introductory public speaking textbooks. The two analyses of post-1996 editions found this to be the case. An analysis of the pre-1997 data shown in Table 25 also supports this claim with a chi-square test finding significant differences between titles in this time period ($\chi^2 = 1617.467$, $df = 52$, $p < .001$). Once again, a visual inspection of the data indicates why this finding is not surprising, despite the availability of one fewer category in which to classify a reference. The use of books

Table 24

Distribution in Types of References Used by Author with All Internet References Combined in a Single Category for the Most Recent Edition of Each Title

		Books	Internet	Journals	Magazines	Newspapers	Other
Primary Author	Beebe	35.0%	12.7%	33.2%	8.0%	7.4%	3.7%
	Brydon	36.1%	30.6%	15.7%	1.9%	6.5%	9.3%
	Coopman	18.5%	19.8%	57.2%	2.3%	1.3%	1.0%
	Devito	63.1%	9.1%	23.9%	2.8%		1.1%
	FordBrown	77.8%	9.5%	3.2%	1.6%		7.9%
	Foss	45.0%	35.6%	8.1%	3.4%	2.7%	5.4%
	Fraleigh	29.1%	25.2%	33.7%	2.3%	6.6%	3.1%
	Gamble	43.5%	9.5%	20.5%	9.9%	12.4%	4.2%
	Gregory	20.7%	32.3%	4.3%	10.4%	13.4%	18.9%
	Grice	55.3%	15.8%	12.1%	6.3%	0.5%	10.0%
	Griffin	37.1%	29.2%	26.8%	1.9%	2.4%	2.7%
	Hamilton	37.2%	16.1%	31.2%	11.8%	2.7%	0.9%
	Hogan	40.0%	26.5%	23.7%	5.2%	3.2%	1.4%
	Jaffee	17.5%	27.2%	32.8%	6.2%	0.8%	15.5%
	Lucas	65.5%	4.7%	17.0%	2.3%	5.8%	4.7%
	Metcalfe	23.0%	7.9%	6.1%	12.4%	11.8%	38.8%
	Monroe	45.5%	24.8%	14.5%	6.7%	2.4%	6.1%
	OHareRubenstein	29.2%	29.9%	33.1%	4.5%	1.3%	1.9%
	OHareStewart	36.6%	23.9%	30.6%	3.8%	1.9%	3.2%
	Osborn	31.5%	29.4%	20.6%	9.7%	4.2%	4.5%
	Ross	40.9%		47.7%	1.3%	3.4%	6.7%
	Rothwell	28.7%	38.3%	21.4%	3.2%	7.2%	1.2%
	Sellnow	47.2%	6.1%	36.8%	5.2%	2.0%	2.6%
	Sprague	32.8%	12.1%	3.4%	15.5%	3.4%	32.8%
	Valenzano	27.8%	61.9%	6.3%			4.0%
	Verderber	40.9%	33.1%	18.6%	5.0%	0.4%	2.1%
	Vrooman	32.5%	23.4%	32.8%	1.7%	0.6%	9.1%
	Zarefsky	45.5%	2.0%	47.5%	1.0%	2.5%	1.5%
Total		35.3%	21.6%	27.6%	5.5%	4.0%	6.1%

ranged from 29.7% to 65% of total references with journals ranging from 2.6% to 53.2%, magazines from 0.7% to 39.1%, newspapers from 0.0% to 10.6% and other from 0.0% to 27.8%.

Is it likely that a consensus might emerge in the near future regarding the preferred percentage of references from each category? A regression analysis of the number of internet references used in an edition over time since 1996 shows change is occurring in the number and percentage of internet references used in introductory public speaking books but no consensus has been reached yet. This is despite 20 years of experience with the internet. The regression equation in Figure 22 shows that the average number of combined internet references increases by 4.09 for each additional year beyond 1997 with the regression line explaining 40.5% of the variance in the number of internet references cited by authors across the years. A Pearson correlation coefficient was calculated and the relationship was found to be significant ($p < .001$).

Various versions of the scatter plot in Figure 26 were created using different combinations of internet documents, summary versus raw data, eliminating outliers in some graphs, and analyzing the data with various regression fit lines. Table 26 shows the results of all the analyses. Only editions published after 1996 were included in the analysis.

Internet data characterized as “some” did not include books, book chapters, conference papers, journals, magazines, newspapers, or other references that could be found in print form but the reference indicated they were retrieved on the internet. Included were web pages. Internet data characterized as “all” included any information located on the internet with the count of this information included in the internet category.

Summary data use a single number to represent the number of internet references used. This number does not take into account the total number of references used in an edition and, as

Table 25

Distribution in Types of References Used by Authors for Pre-1997 Editions

		Books	Journals	Magazines	Newspapers	Other
Primary Author	Beebe	63.6%	14.4%	7.1%	4.3%	10.6%
	Brydon	65.0%	17.5%	3.6%	4.4%	9.5%
	Foss	61.9%	3.2%	25.4%	1.6%	7.9%
	Gregory	37.9%	14.4%	17.6%	2.6%	27.4%
	Grice	55.6%	5.2%	28.4%	3.9%	7.0%
	Jaffee	54.3%	11.3%	8.2%	10.6%	15.6%
	Lucas	63.7%	19.9%	5.8%	1.6%	9.0%
	Metcalfe	42.2%	6.0%	21.4%	2.6%	27.8%
	Monroe	60.3%	22.4%	9.3%	0.7%	7.3%
	Osborn	53.2%	24.0%	11.4%	4.4%	7.0%
	Ross	50.4%	32.5%	3.7%	4.2%	9.2%
	Sprague	56.1%	2.6%	22.6%	0.6%	18.1%
	Verderber	29.7%	10.1%	39.1%		21.1%
	Zarefsky	45.3%	53.2%	0.7%	0.7%	
Total		52.6%	19.2%	12.9%	2.7%	12.6%

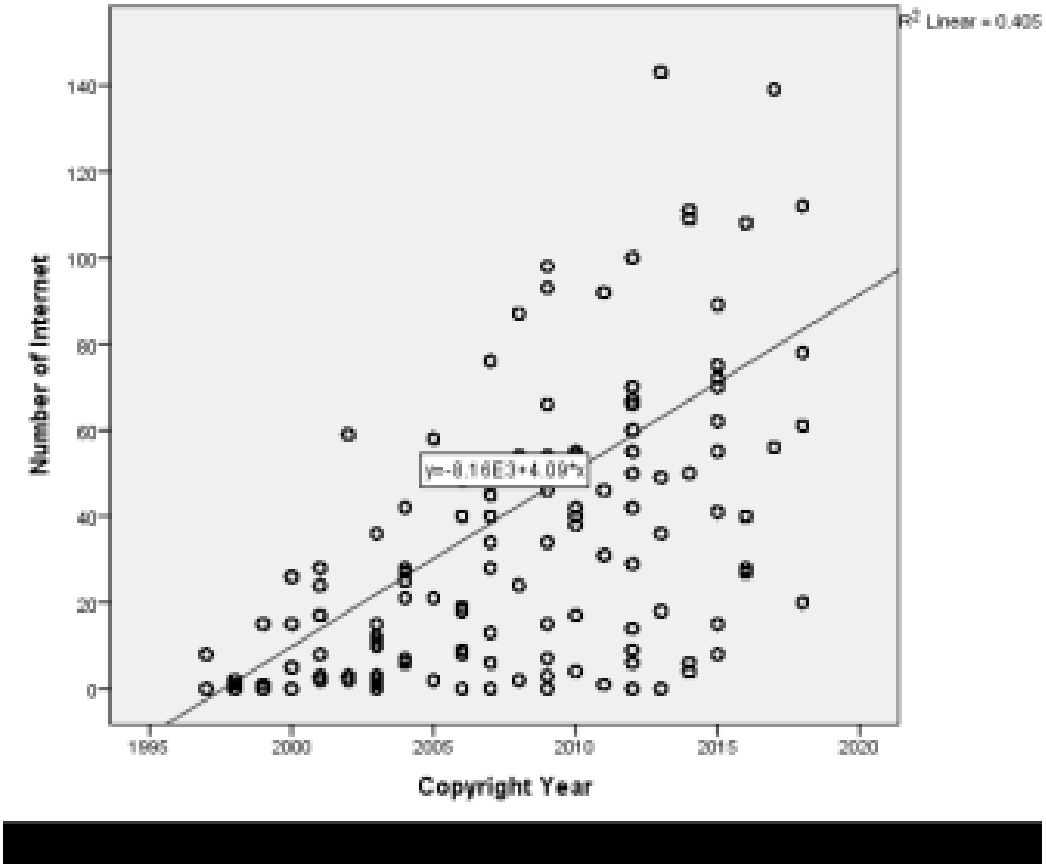

Figure 22: Scatter plot of number of internet references compared by copyright year for post-1996 editions using summary data.

Table 26

Results of Different Regression Analyses of Copyright Year with Post-1996 Editions and Number of Internet Documents

Data Set	**Internet Data Used**	**Outliers?**	**Intercept**	**Slope**	r^2
Summary Data	All	Yes	-0.00857	4.29	.292
Summary Data	All	No	-0.00806	4.03	.318
Summary Data	Some	Yes	-0.00669	3.35	.309
Summary Data	Some	No	-0.00656	3.28	.332
Raw Data	Some	Yes	-0.00816	4.09	.405
Raw Data	Some	No	-0.00783	3.92	.417
Raw Data	All	Yes	-0.00986	4.94	.351
Raw Data	All	No	-0.00932	4.67	.381
Raw Data, Quadratic fit	All	Yes			.351
Raw Data, Cubic fit	All	Yes			.355

a result, is not a weighted value. With the summary data, each edition is considered to contain the same number of references with 177 cases overall and 132 cases that involve editions published in 1997 or more recently. The raw data, on the other hand, include 43,094 cases overall and 35,432 cases that involve editions published after 1996. Each case is weighted equally, avoiding the problem of a book with few references biasing the results.

Outliers were identified by SPSS box plots and defined as the value of the interquartile range times 1.5 added to the value of the 75% quartile or subtracted from the 25% quartile value. In the case of summary data, the interquartile range is 61, and outliers are values greater than 161. Four editions out of 132 were outliers and included Jaffee's (2009, 2013) 6th, and 7th editions with 196 and 168 internet references respectively, as well as Rothwell's (2014, 2017) 1st and 2nd editions with 161 and 191 references respectively. In the case of the raw data, 952 outliers were identified.

Of course there was an effect on the r^2 values when outliers were converted to a number equal to the highest non-outlying value since values were made closer to the regression line, but the effect was small. When summary data were used and only some of the internet references were used in the regression analysis, the elimination of outliers increased the r^2 value from .309 to .332. When summary data were used and all internet references were used in the regression analysis and outliers were converted, the r^2 value increased from .309 to .332. When the raw data were used and only some of the internet references were used, the elimination of outliers increased the r^2 value from .405 to .407. When the raw data were used and all internet references were combined for the regression analysis, the r^2 value increased from .292 to .318 when outliers were transformed. At most, then, transforming outliers increased the variance explained

by an extra .026 or 2.6% of the total variance.

There was a similar positive effect on the r^2 values when only some of the internet data were used instead of all of it. When analyzed using summary data, use in the count of only those internet references that were not found in print compared to using all internet references increased the r^2 value from .292 to .309 when outliers were not adjusted. When analyzing summary data and adjusting the outliers, use of some internet references in the count compared to using all internet references increased the r^2 value from .318 to .332. When conducting the analysis using the raw data, use of some internet references in the count compared to using all internet references increased the r^2 value from .351 to .405. This change of .054 is the greatest increase between the pairs. When conducting the analysis using the raw data with outliers corrected, use of some of the internet references in the analysis rather than all internet references regardless of type, the r^2 value increased from .381 to .417. This overall result indicates that some authors used more internet material that was not a web page than other authors, increasing the variance when all internet sources are combined and analyzed.

The simple scatter graph in Figure 22 suggested there might be a curvilinear relationship between the number of internet sources and the copyright data so a quadratic fit was evaluated. The results, shown in Table 26 show the r^2 value equaled .351. This regression line looked similar to a linear regression line and the r^2 value was the same as one of the linear models and less than three other linear models so this model was not considered any further. A cubic fit line produced an r^2 value of .355 but the improvement was so small the more complex model would not be considered a better model.

The next step taken was to conduct the analysis using the percentage of internet

references rather the absolute number of internet references. Figure 23 shows a simple scatter plot using raw data in which the percentage of all internet references with adjusted outliers are plotted against the copyright year with a regression line added to the scatter plot. The r^2 value in this case equaled .363, or that 36.3% of the variance in the percent of internet references was explained by the copyright year of the edition. A quadratic fit using raw data of the percentage of all internet references with unadjusted outliers produced an r^2 value of .468 and a cubic fit resulted in an r^2 value of .470.

Outliers varied depending on whether internet documents only included web pages or if they included any document found on the internet. The former was classified for this study as "some" internet data and the later was classified as using "all" internet data. Given that some textbook users may frown on the use of web pages because they may not be perceived as credible as information from other sources, the outliers were identified by author and edition as well as with an indication of how far the percentage was from the nearest value that was not an outlier.

When summary statistics were used and only some internet data were included in the analysis, there were four outliers. These included Hamilton's (2006) third edition at the low end with only 2% of references being web pages, the third edition of Foss (2012) at the upper end of the distribution with 34% of references from web pages, the second edition of Valenzano (2012) with 51% of references from web pages, and the third edition of Valenzano (2015) with 56% of references from web pages. The low end value was converted to 7% and the high end value was converted to 19% for Foss (2012) and Valenzano (2012), and to 22% for Valenzano (2015) when the analysis was run with no outliers.

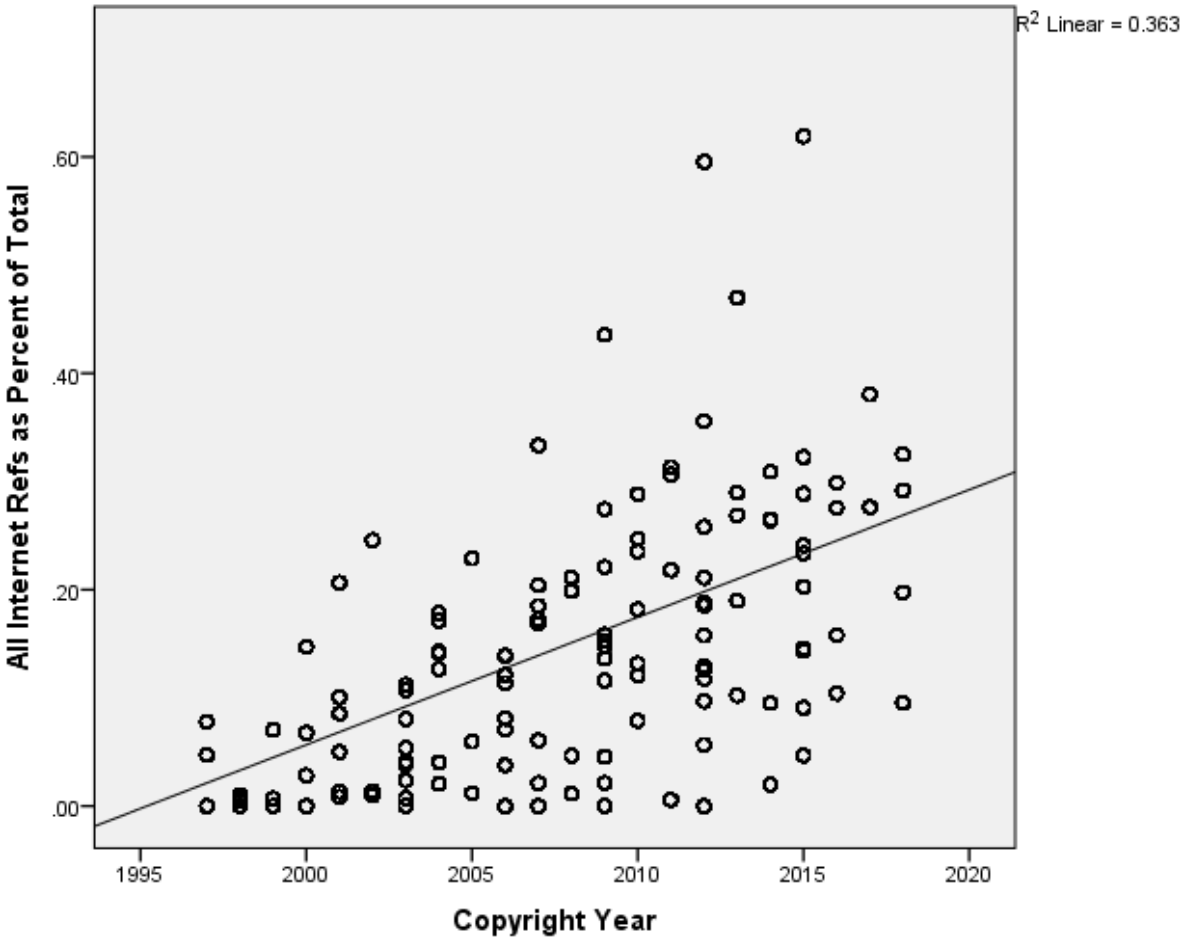

Figure 23: Scatter plot comparing percent of all internet references to copyright year using raw data for post-1996 editions.

Table 27

Results of Different Regression Analyses and Correlations of Copyright Year and Percent of Internet Documents for Post-1996 Editions

Data Set	**Internet Data Used**	**Outliers?**	**Intercept**	**Slope**	r^2	***p***	***df***	***F***
Summary	All	Yes	-23.334	0.012	.289	< .001	1, 116	46.641
Summary	All	No	-21.742	0.011	.346	< .001	1, 116	60.912
Summary	Some	Yes	-18.46	0.009	.281	< .001	1, 116	44.899
Summary	Some	No	-16.64	0.008	.334	< .001	1, 116	57.731
Raw	Some	Yes	-18.224	0.009	.349	< .001	1, 32835	17593.9
Raw	All	Yes	-23.520	0.012	.363	< .001	1, 35430	20151.738
Raw	All	No	-23.469	0.012	.467	< .001	1, 35430	31000.029
Raw, Quadratic fit	All	No			.468			
Raw, Cubic fit	All	No			.470			

When summary statistics were used and all internet data were included in the analysis there were again four outliers. All four outliers were at the high end of the distribution and came from two titles. The fourth edition of Jaffee (2004) used the internet for 32% of its references and 44% of its references for the 2007 fifth edition. For the second edition of Valenzano and Braden's text (2012), 60% of the references came from the internet while the 2015 third edition used the internet for 62% of all references. The value for Jaffee (2004) was converted to 20% from 32% and the value for Jaffee (2007) was changed from 44% to 27%. The value for Valenzano and Braden (2012) was recoded from 60% to 35% while the value for the next edition of Valenzano and Braden's (2015) edition was changed to 32% from 62%.

Changes in the number of books used over time by authors were evaluated next. Figure 24 shows a scatter plot comparing the number of references to books per 100 pages to the copyright year. This analysis used summary data and found a linear fit line explained 4% of the variance in the number of references to books. A cubic fit line explained 4.6% of the variance. A two-tailed test of significance found the relationship between the two to be significant (p = .008).

To assess if the relationship between the number of book references per 100 pages was affected by the introduction of the internet, a scatter plot of the number of book references per 100 pages was created for editions after 1996. This scatter plot can be found in Figure 25. The results show a linear fit line explains only 1.3% of the variance in the number of references to books in this time period. The amount of variance explained increases to 5.1% when books found on the internet, and book chapters are included in the category. Figure 26 shows the scatter plot for these data with a linear fit line included. When only editions published after 1996 are examined using books, books found on the internet, and book chapters, a scatter plot of the data compared to the copyright year shows a linear fit explains only 1.6% of the variance. This scatter plot is found in Figure 27. These results are consistent with the idea that there was not an increase in the use of references to physical books between 1970 and 2018 but, after 1996, references to internet books or chapters available on the internet increased; however, there was not acceleration in the use of these internet book materials. After the initial increase in internet book references, the rate of use stayed the same.

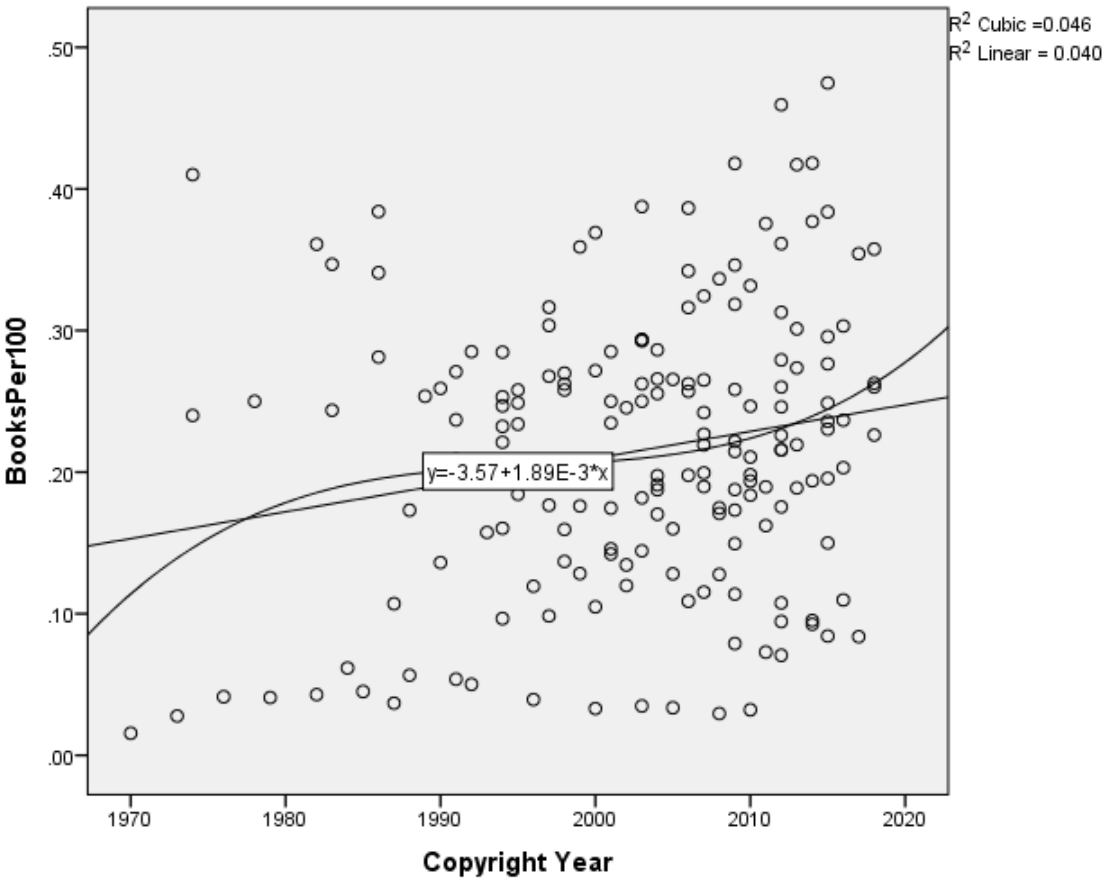

Figure 24: Scatter plot of books per 100 pages compared to the copyright year using summary data for all years.

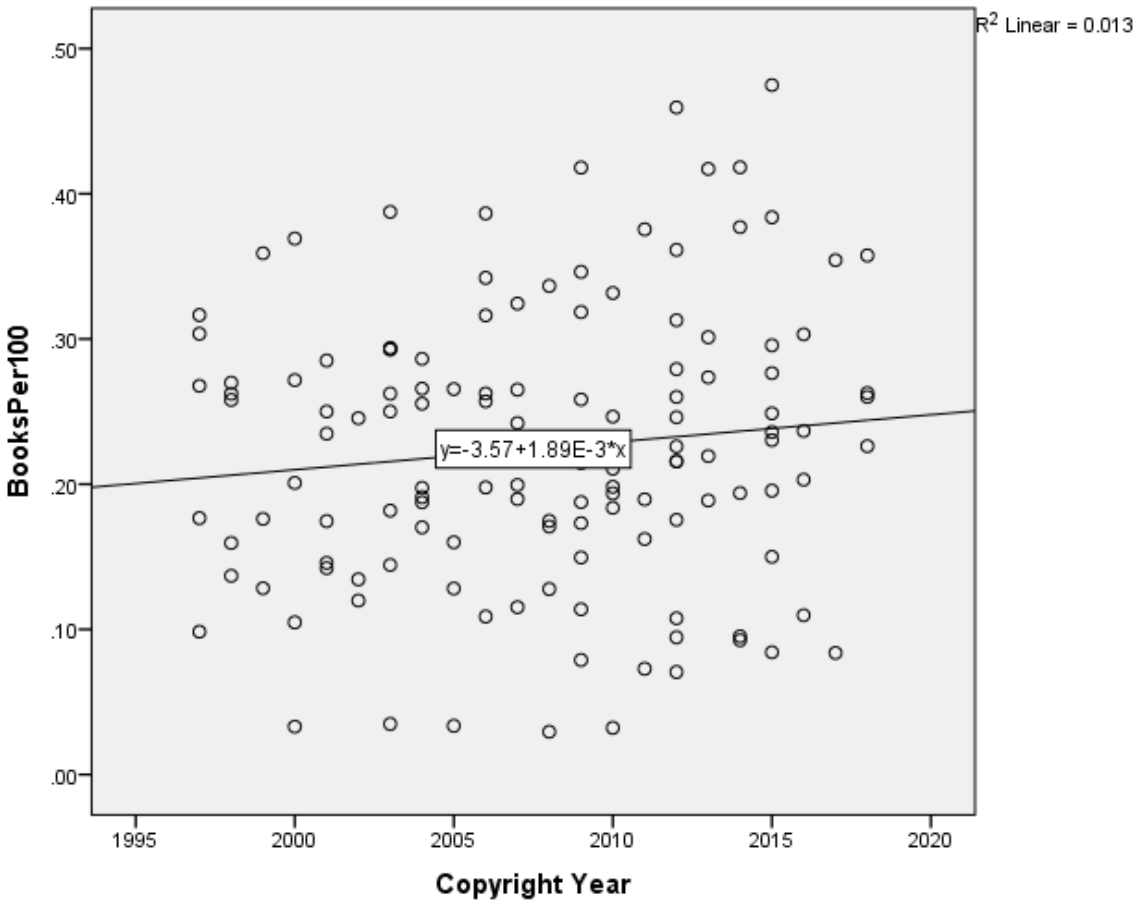

Figure 25: Scatter plot of books per 100 pages compared to the copyright year using summary data for editions after 1996.

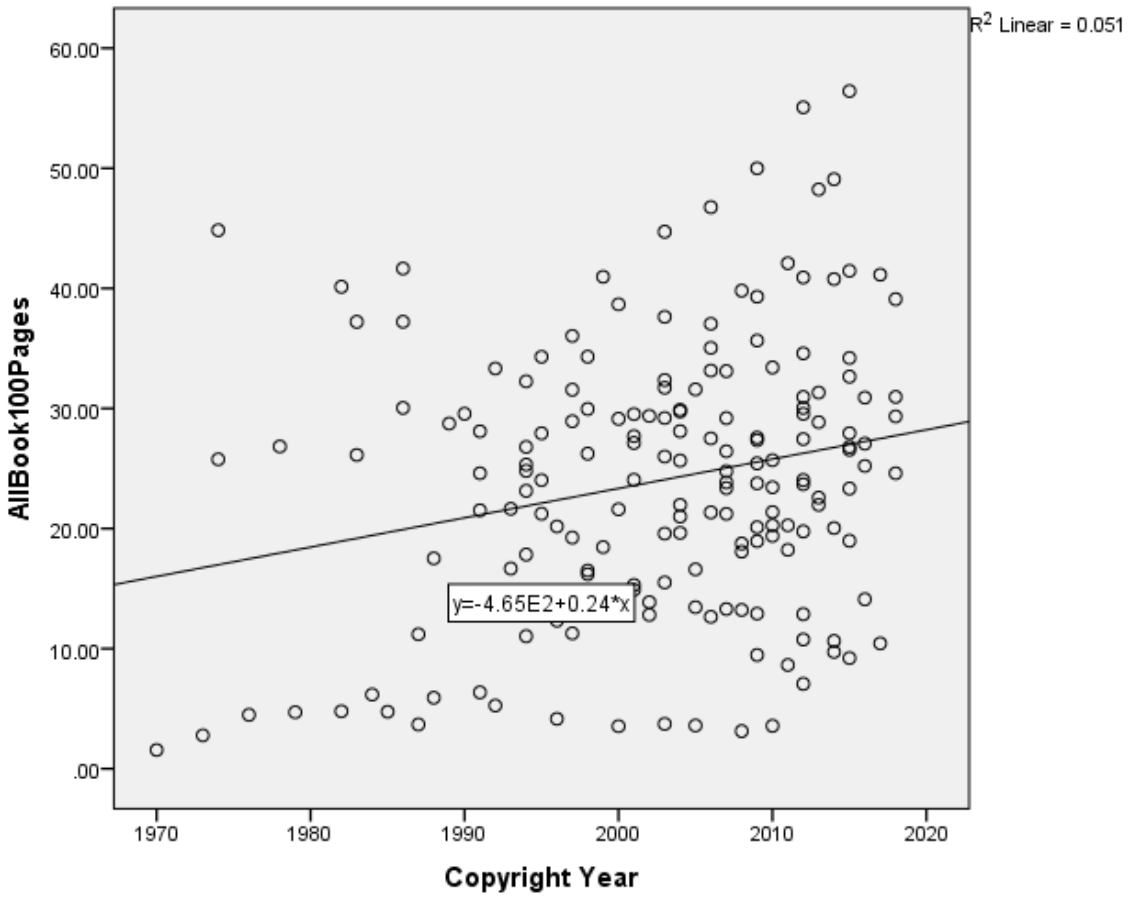

Figure 26: Scatter plot of all book references (books, internet books, and chapters) per 100 pages compared to the copyright year using summary data for all years.

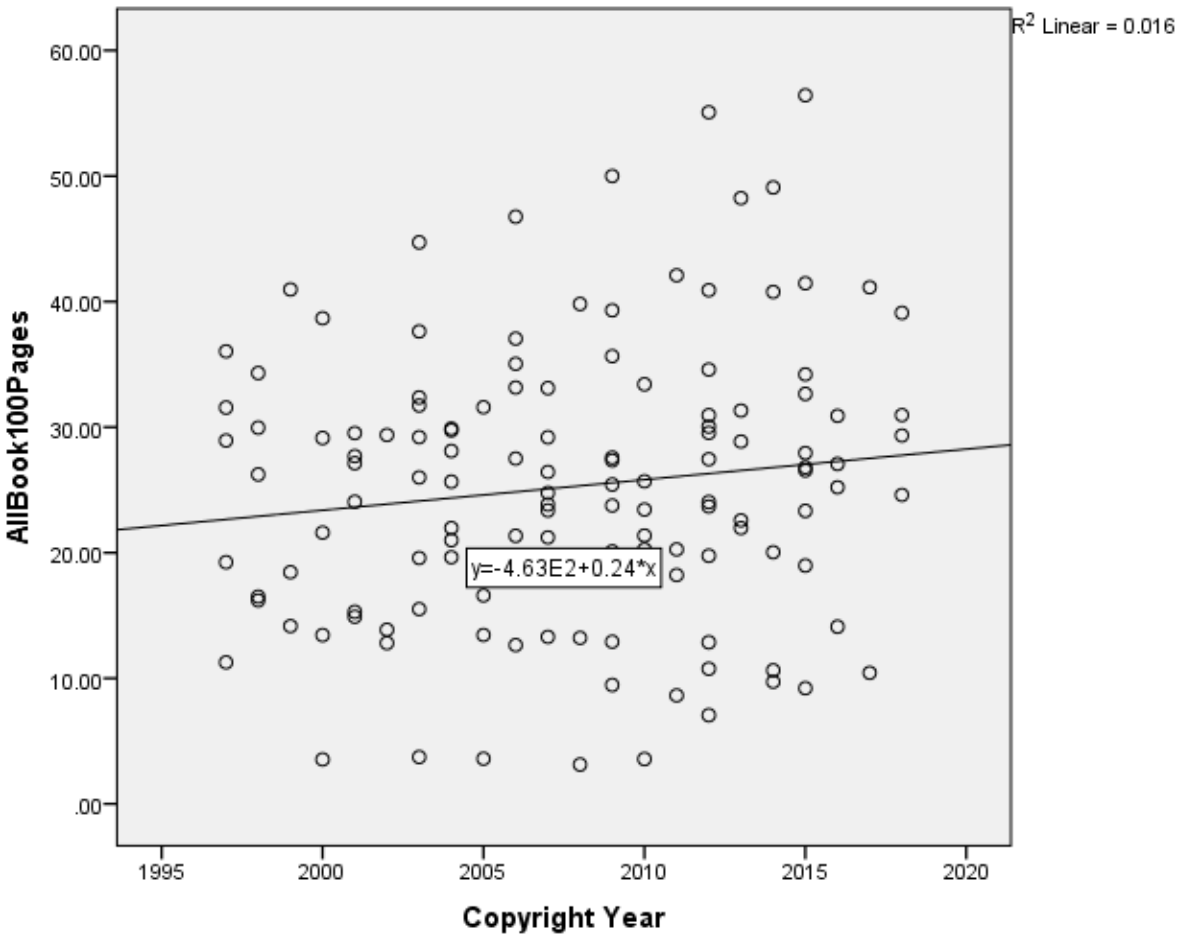

Figure 27: Scatter plot of all book references (books, internet books, and chapters) per 100 pages compared to the copyright year using summary data for editions after 1996.

The relationship between the number of references to journals per 100 pages and the copyright year of an edition is shown in Figure 28. A linear fit to the data explained 13.8% of the variance while a cubic fit explained 18.9% of the variance between the copyright year and the number of references to journals per 100 pages. Both fit lines show an increase in the number of references to journals used by introductory public speaking books published between 1970 and 2018. A two-tailed test of significance shows the linear relationship is significant ($p < .001$). When only editions published after 1996 are examined, the amount of variance explained by a linear fit line is not as great although still statistically significant ($p < .001$). As shown in Figure 29, the linear fit line explains 12.6% of the variance in the number of references per 100 pages. A quadratic fit explains 13.8% of the variance and a cubic fit explains 14.1% of the variance. Since the quadratic fit was neither the simplest nor the best fit, it was not included in the graph. When journals found on the internet are included in the category of "journals," there are similar results. The linear fit line explains 12.9% of the variance between the number of journal references and the copyright year which is 0.3 percentage points more. A quadratic fit line explains 14.2% of the variance while a cubic fit line explains 14.4% of the variance.

The relationship between the number of references to magazines per 100 pages and the copyright year is shown in Figure 31. A linear fit to the scatter plot between these two variables only explained 0.6% of the variance in the number of references per 100 pages. A cubic fit explained more variance, reaching 4.8% of the variance in the number of magazine references per 100 pages. The correlation between the number of magazine references per 100 pages and the copyright showed no significant correlation between the two of them ($p = .313$).

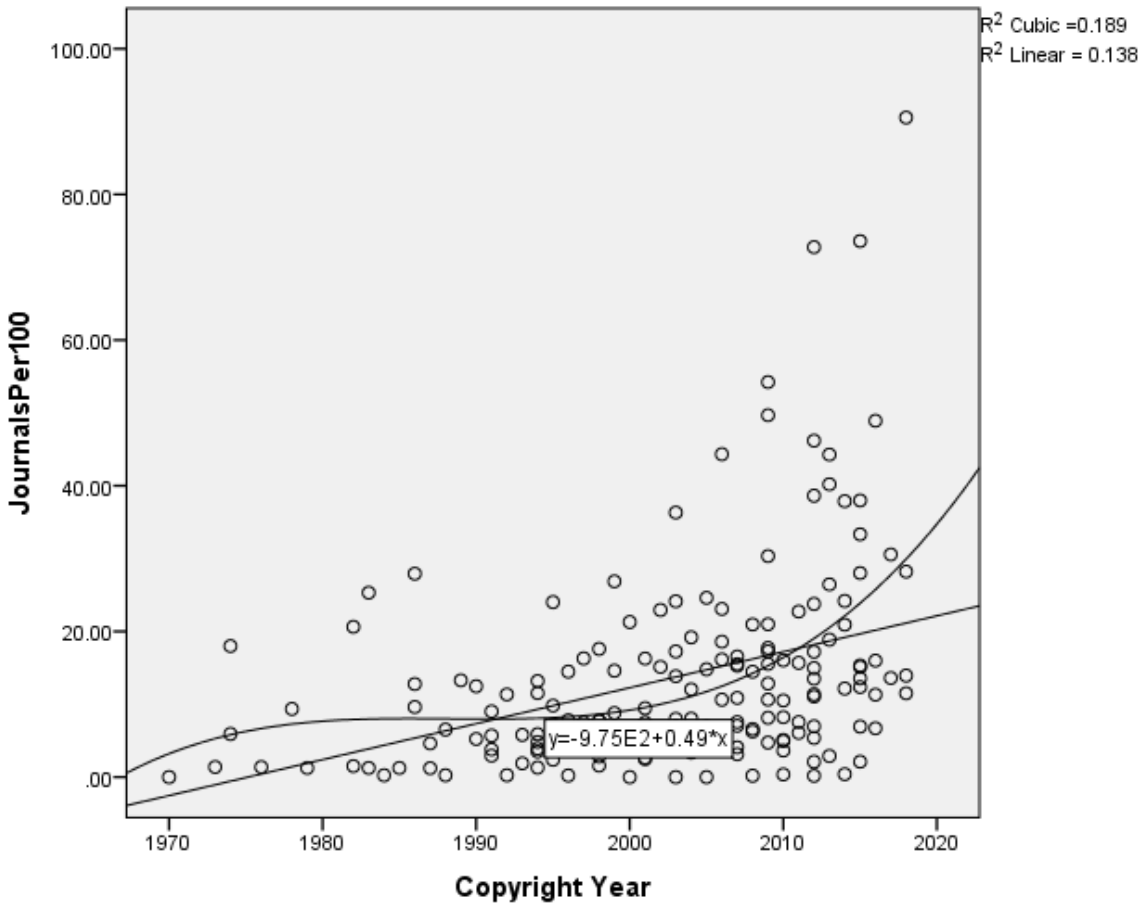

Figure 28: Scatter plot of journals per 100 pages compared to the copyright year using summary data for all years.

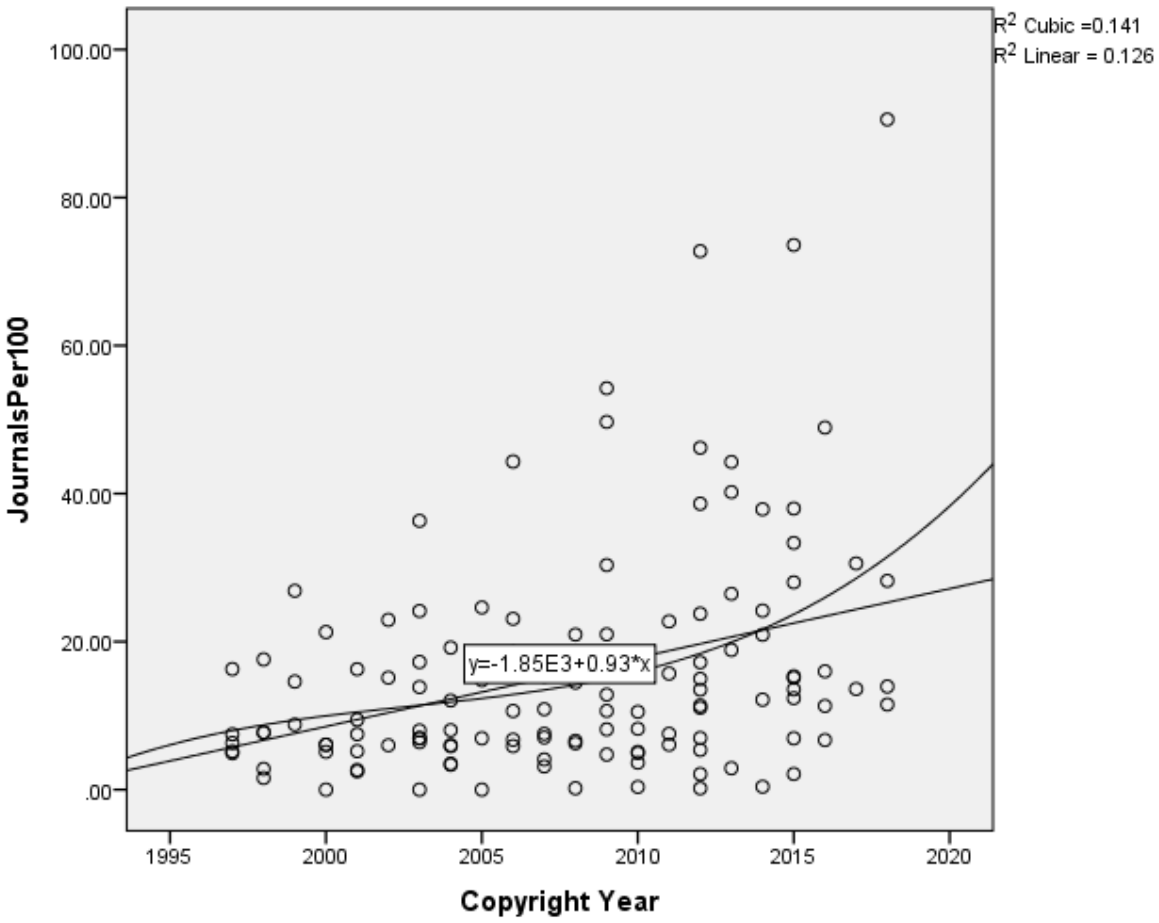

Figure 29: Scatter plot of journals per 100 pages compared to the copyright year using summary data for editions after 1996.

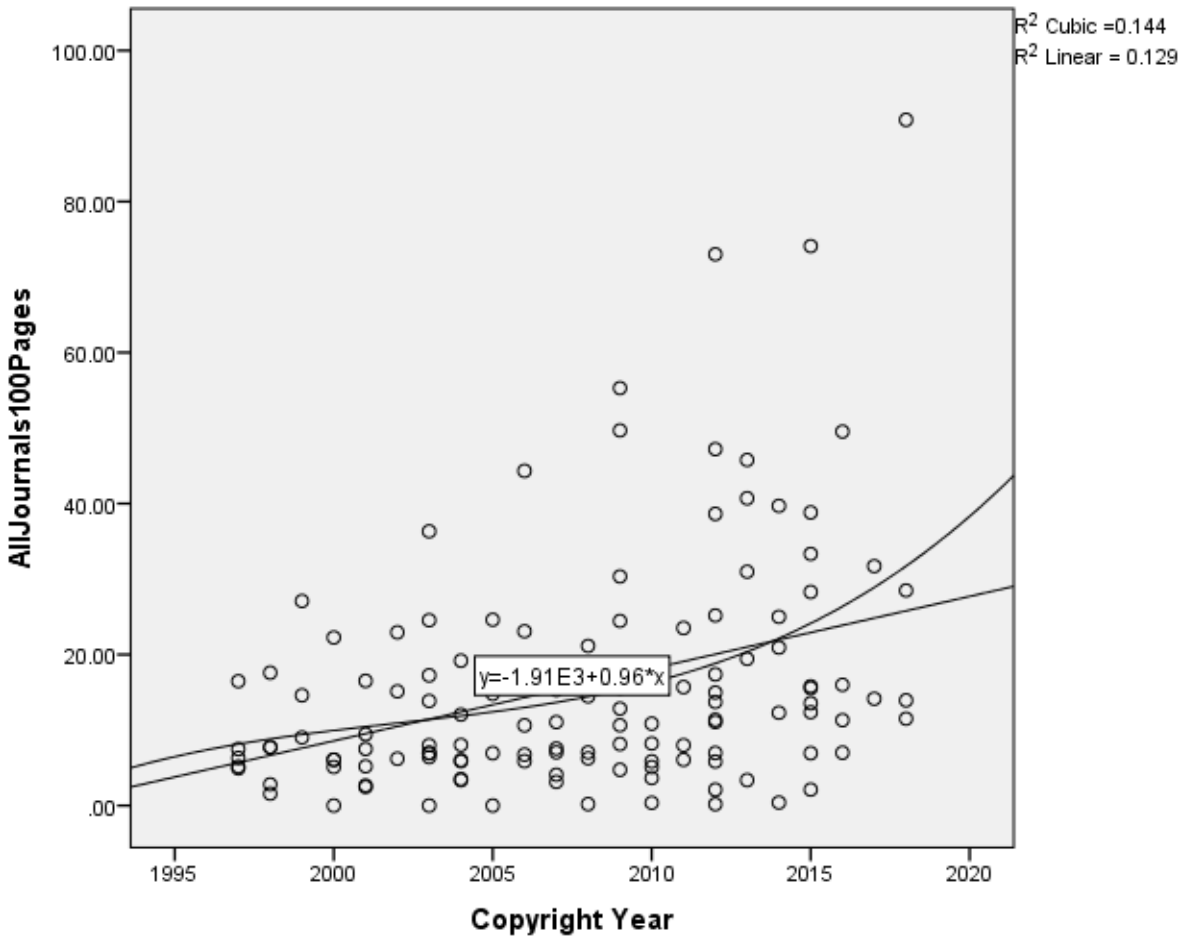

Figure 30: Scatter plot of all journal references per 100 pages compared to the copyright year using summary data for editions after 1996.

As shown in Figure 31, there is a decrease in the number of magazine references over time. Figure 31 shows the decrease in the number of magazine references used is even more pronounced for years after 1996. The linear slope for all years since 1970 is -0.03 but is more extreme after 1996 when the slope equals -0.22 (see Figure 32). The linear fit for this abbreviated time period explains 6% of the variance in the number of magazine references per 100 pages.

As shown in Figure 33, references to newspapers not found on the internet per 100 pages have increased over the years beginning in 1970 to 2018. A linear fit to a scatter plot of these references compared to the copyright year indicates 5.5% of the variance in the number of references per 100 pages is explained by the copyright year. A quadratic fit explained 5.9% of the variance while a cubic fit explained 6.5% of the variance. A two-tailed test of significance shows that the two variables are significantly correlated ($p = .002$). A scatter plot comparing references to internet newspapers and the copyright year of an edition was created to assess the effect of adding this data to the category of "newspapers." There is essentially no change in the number of references to internet newspapers since the advent of the internet in 1996 and the copyright year does not explain any of the variance in the number of these references. Figure 34 shows a scatter plot of these data. When references to internet newspapers is added to the "newspaper" category and the resulting sum compared to the copyright date of the edition, the linear fit line for the years after 1996 resulted in less variance explained (see Figure 35). Rather than accounting for 5.5% of the variance in the number of newspaper references per 100 pages, only 4% of the variance was explained when the shorter time span was considered. A two-tailed test of significance found this relationship to be significant ($p = .022$). A cubic fit line explains slightly more variance at 4.3%.

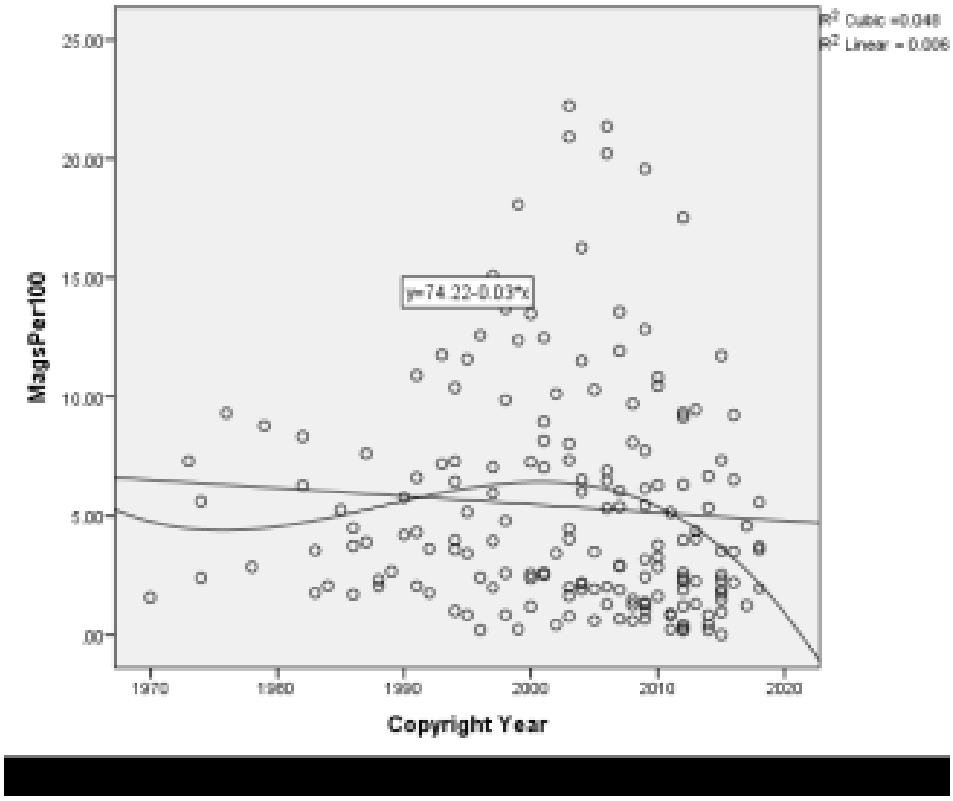

Figure 31: Scatter plot of magazines per 100 pages compared to the copyright year using summary data for all years.

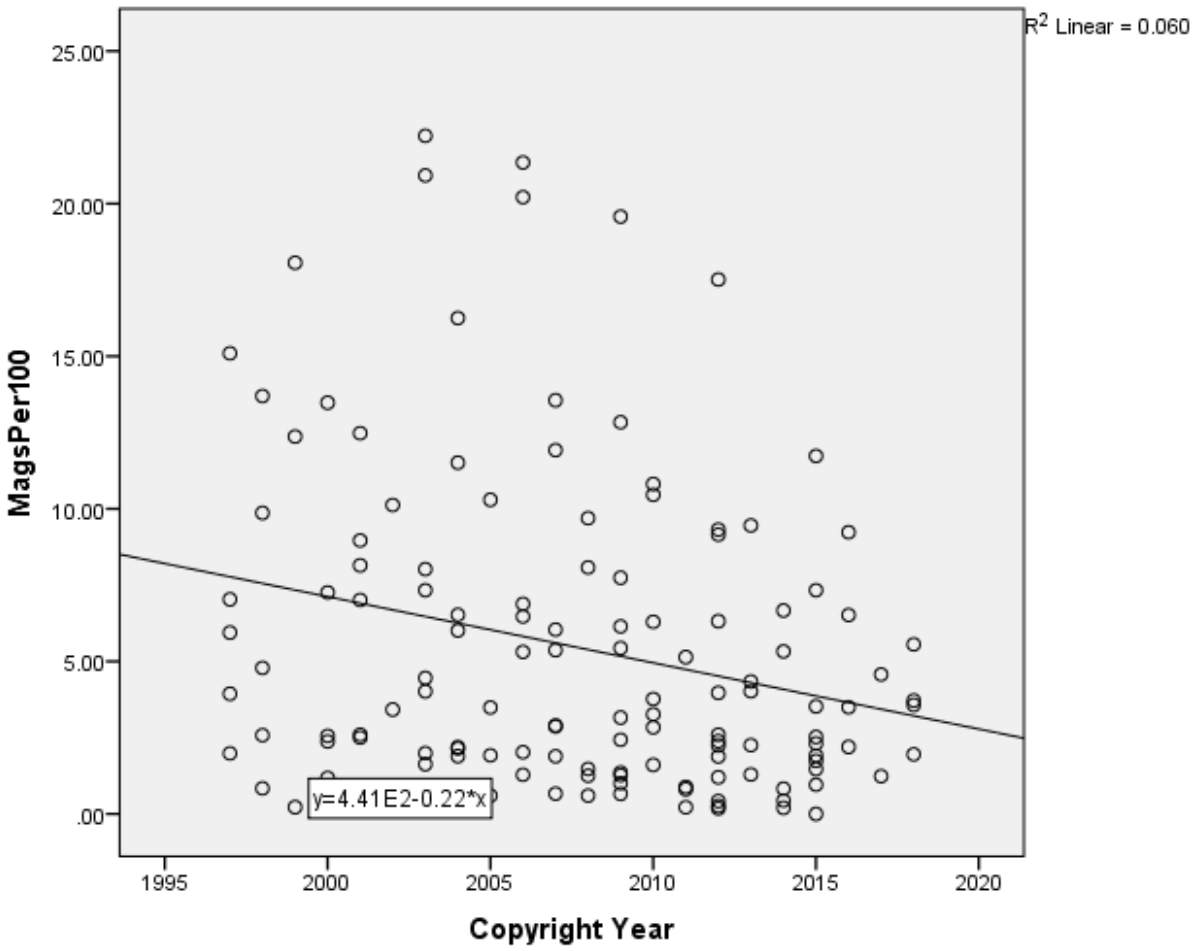

Figure 32: Scatter plot of magazines per 100 pages compared to the copyright year using summary data for editions after 1996.

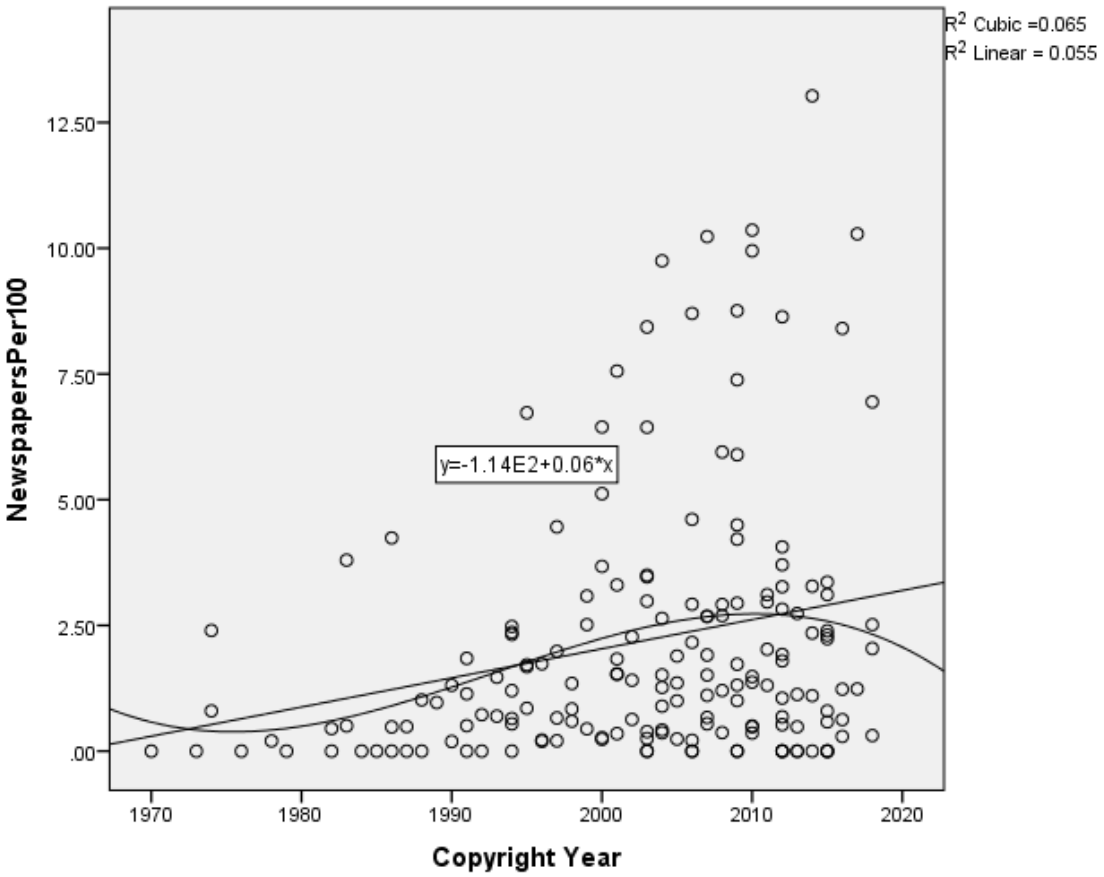

Figure 33: Scatter plot of noninternet newspaper references per 100 pages compared to the copyright year using summary data for all years.

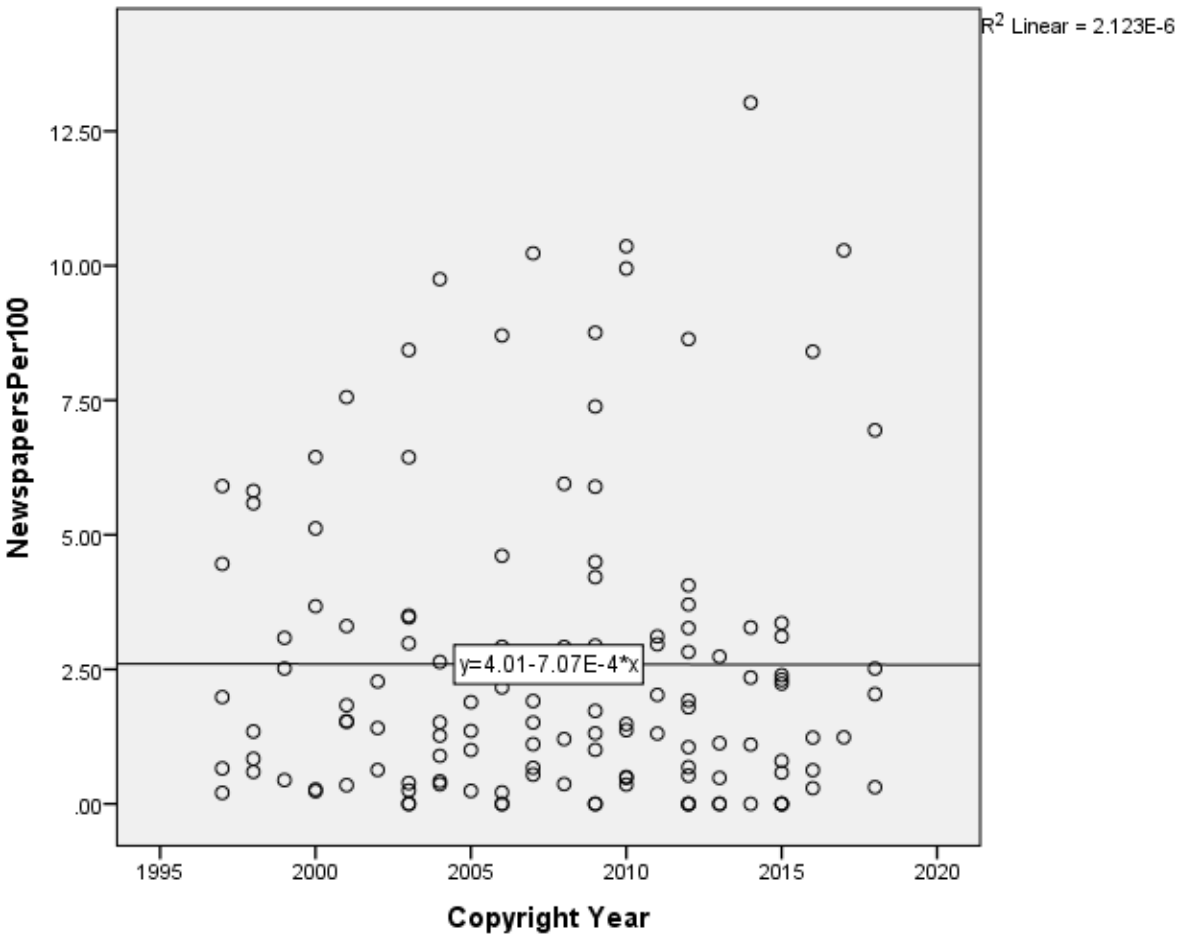

Figure 34: Scatter plot of noninternet newspaper references per 100 pages compared to the copyright year using summary data for editions after 1996.

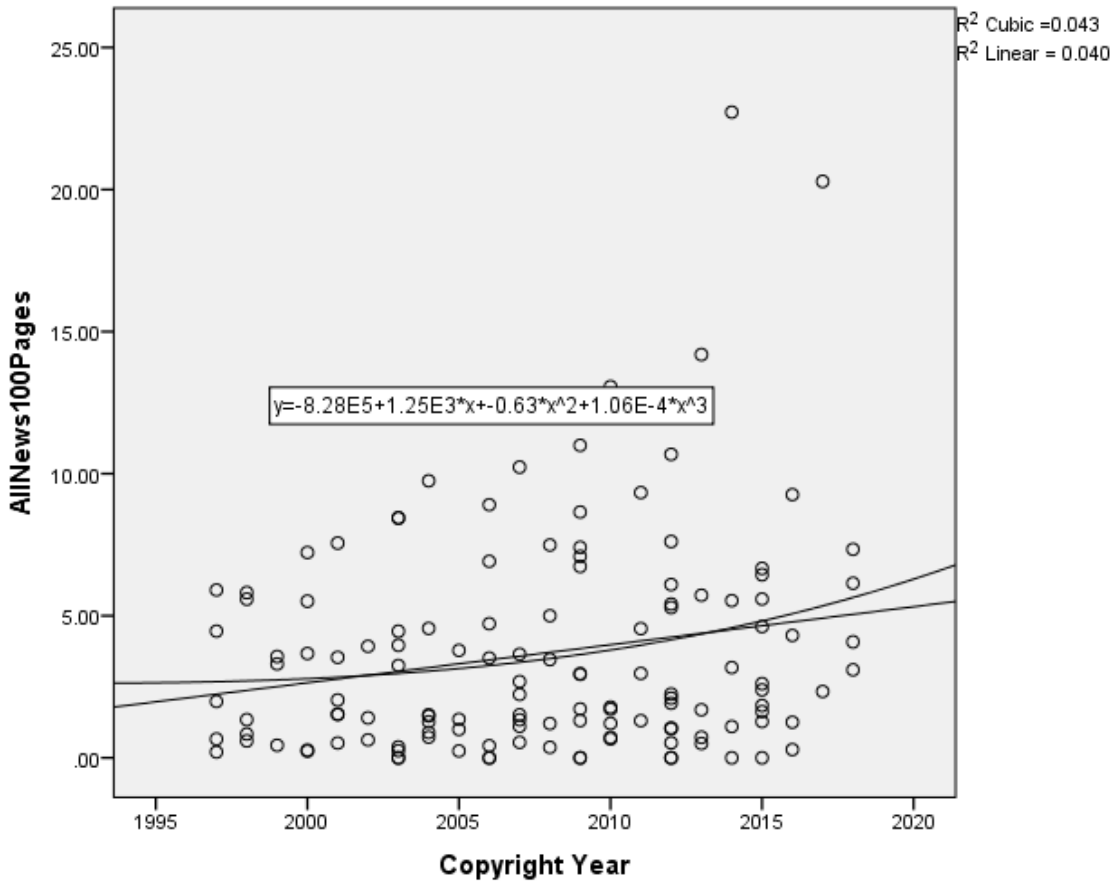

Figure 35: Scatter plot of all newspaper references (internet plus noninternet) per 100 pages compared to the copyright year using summary data for editions after 1996.

The final comparison involves comparing the number of references to other material per 100 pages to the copyright year. Figure 36 shows a scatter plot of these data. A linear fit line of the scatter plot explained very little of the variance (r^2 = .006). A quadratic fit explained slightly more (r^2 = .013) and a cubic fit the same as the quadratic fit (r^2 = .013). A two-tailed test showed the linear relationship was not significant (p = .299). As shown in the scatter plot in Figure 37, the internet did not change this much. The variance explained was only 1% in this time period after 1996.

In the next chapter, these results are discussed in more detail and general conclusions drawn. Explanations for the results are offered related to the extent of changes in the number, age, and type of references. Implications for research and practice are identified as well as suggestions for future research. Finally, limitations of this study are presented.

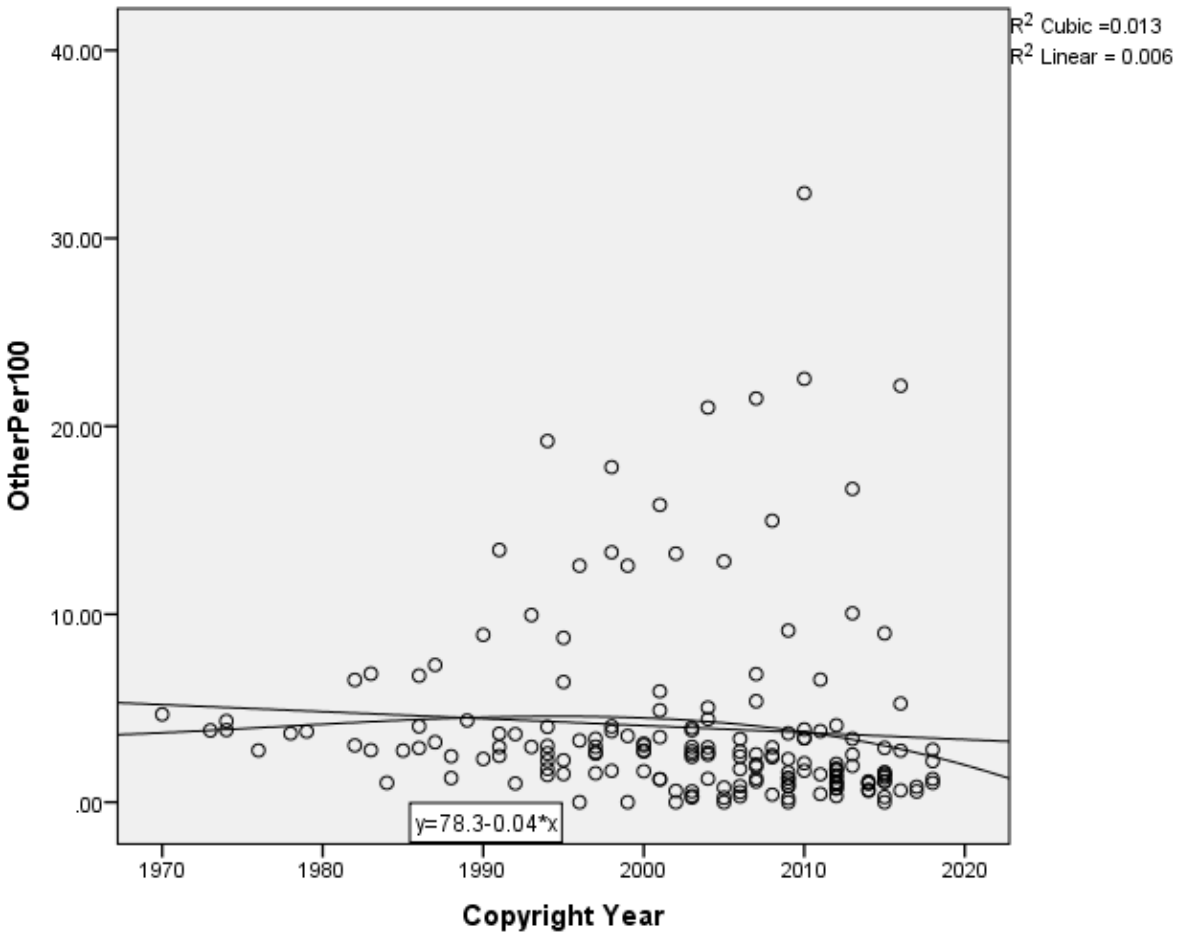

Figure 36: Scatter plot of other references per 100 pages compared to the copyright year using summary data for all years.

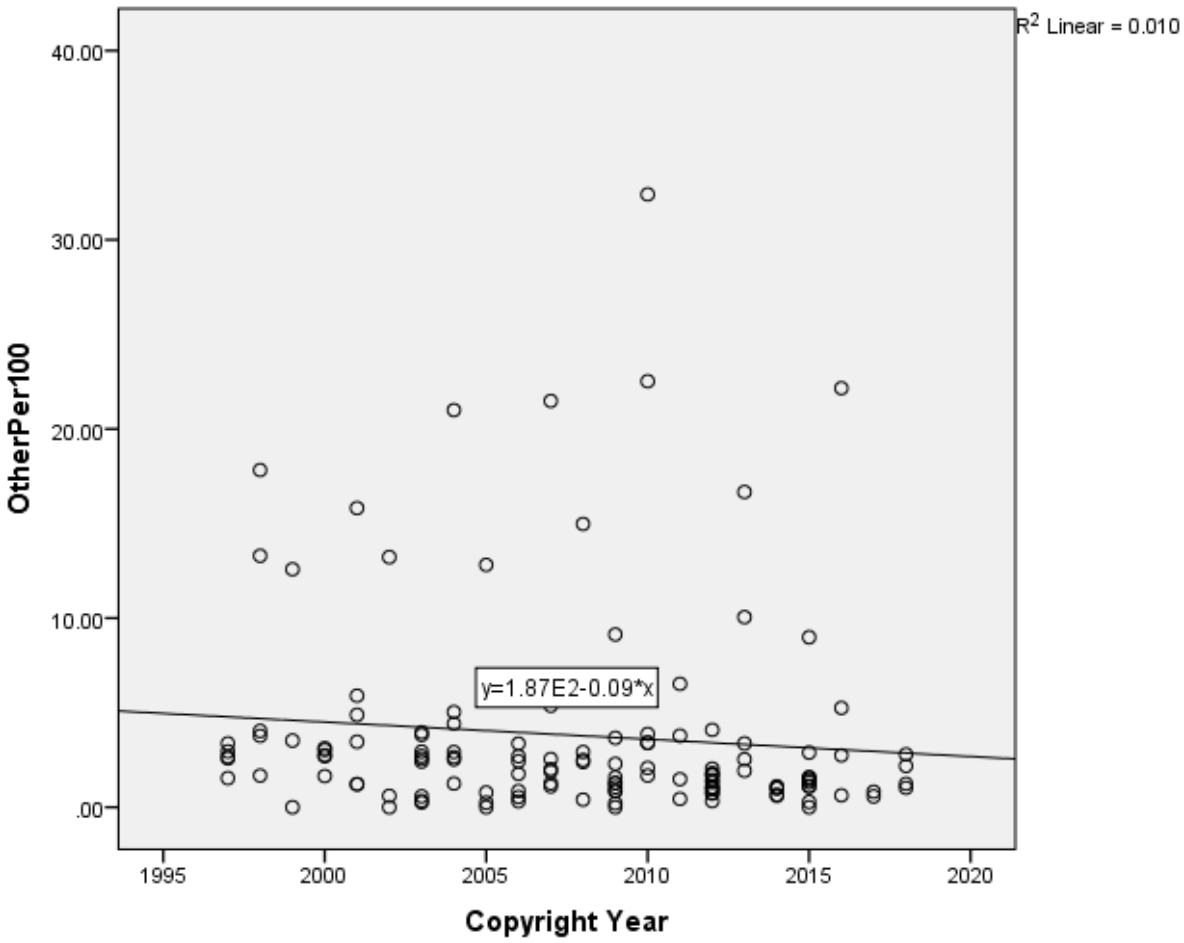

Figure 37: Scatter plot of other references per 100 pages compared to the copyright year using summary data for years after 1996.

CHAPTER 5

DISCUSSION AND CONCLUSION

In this chapter, several topics are discussed. First, overall findings are reviewed regarding the extent that the number, age, and type of references change in subsequent editions of United States, national edition, introductory, college, public speaking textbooks. Second, implications for prior research are covered including investigations related to the number, age, and type of references. Third, implications for practice are examined including how this research could affect students, faculty, institutions, publishers, national associations, library systems, journals, and used book sellers. Fourth, suggestions for future research are made. Finally, study limitations involving the data, analysis, scope, and explanations are provided.

Overall Findings

In this section, overall findings are reviewed regarding the extent that the number, age, and type of references change in subsequent editions of United States, national edition, introductory, college, public speaking textbooks. Broad conclusions are made and explanations explored for the results. Nuances in the results are noted in some cases. Table 28 presents major findings with indications of the data used and the relevant table or figure associated with these findings.

Table 28

Major Findings

Data Used	Statement of Results (Relevant Table or Figure)	Statistics
Summary	The mean number of references across all books (Table 4)	246.59
Summary	The median number of references across all books (Table 4)	217.0
Summary	The number of pages is significantly related to the number of references but explains little variance	p = .008 r^2 = .04
Summary	For every 5-year period since 1984-1988, the average number of references for introductory public speaking books in the time period has increased (Table 14, Figure 5)	
Summary & Raw	For every 5-year period since 1984-1988, the average number of references per 100 pages for introductory public speaking books in the time period has increased (Figure 7, Figure 8)	
Raw	The copyright year is significantly related to the number of references per 100 pages. A cubic fit line best explains the variance between the two variables. (Table 10)	p < .001 r^2 = .254
Raw	Books with footnotes have significantly more references per 100 pages than books that use a bibliography.	p < .001 r^2 = .202
Raw	The edition of a book explains little of the variance in the average age of references. A cubic fit line best explains the variance between the two variables. (Figure 17)	r^2 = .002
Summary	The mean age of references. (Table 13)	15.658
Summary	The median age of references. (Table 13)	14.800
Raw	Significant differences exist in the average age of references across editions.	p < .001
Raw	Significant differences exist in the average age of references across different years.	p < .001
Summary	The average age of references significantly increases as the copyright year increases. (Figure 21)	p < .001 r^2 = .147
Raw	Significant differences exist in the distribution of reference ages across 5-year time periods but little variance is explained by the relationship. (Table 16)	p < .001 r^2 = .002
Raw	Before 1997, books were 52.6% of all references, journals were 19.2%, and magazines were 12.9%. (Table 19)	
Raw	After 1996, books were 40.2% of all references, journals were 24.9%, internet references were 12.2%, and magazines were 10.1%. (Table 20)	
Summary	Significant differences exist between authors in the use of different types of references.	p < .001

(continued on following page)

Table 28 (continued)

Data Used	Statement of Results (Relevant Table or Figure)	Statistics
Summary	For post-1996 editions, the copyright year is significantly related to the number of internet references. (Figure 22)	$p < .001$ $r^2 = .405$
Summary	The number of references to books per 100 pages is significantly correlated to the copyright year but explains little variance. (Figure 24)	$p = .008$ $r^2 = .040$
Summary	The number of references to journals per 100 pages is significantly correlated with the copyright year. (Figure 28)	$p < .001$ $r^2 = .189$
Summary	The number of references to magazines per 100 pages is significantly correlated to the copyright year for post-1996 editions.	$p = .005$
Summary	The number of references to newspapers per 100 pages is significantly correlated to the copyright year for post-1996 editions but explains little variance. (Figure 35)	$p = .022$ $r^2 = .043$

Changes in the Number of References

Four broad conclusions can be made about how the number of references changes in subsequent editions. These conclusions deal first with the effect of the edition, second with the effect of the copyright year, third with the effect of the internet, and finally with the effect of using footnotes versus a bibliography. More specific conclusions would depend on the data set used, if years are grouped, what analysis is run, and the dependent variable.

In general, as the edition increases, the number of references increases. This is the case until somewhere between the 5th and 8th edition, depending on whether raw or summary data are used, and on whether the dependent variable is the mean number of references or the mean number of references per 100 pages. After this peak, the number of references drops until between the 11th and 14th edition with an uptick after this.

As a second broad conclusion, as the copyright year increases beginning in 1970, the number of references increases. There is an initial peak between 1974 and 1983, a decline over the next five years but then a pattern of increasing numbers from 1984 to 2018, a 34 year period of an increasing number of references. Most of this time period (22 years) occurs after authors started using the internet

Third, the internet took hold in 1997. Before 1997, there was little change in the number of references across the years. In 1997, a pattern of increase occurred. 1997 is also the first year that the internet was used as a reference.

Fourth, authors using footnotes use more references but the pattern of use mirrors that of bibliography users. Since only 4 of 28 titles used footnotes and only 8.5% of the 177 editions contained footnotes, this conclusion does not have strong backing. In addition, all four of the titles with footnotes were first published after 1999 and two were first published after 2013.

One explanation for why authors use more sources involves the amount of information available to use. Line and Sandison (1974) note that if there is growth in the amount published each year, researchers have more information available to use. Although they made this point in regards to the average age of material rather than the amount, the argument still applies.

A second explanation is that there could be greater expectations in an author's discipline to use more sources. These expectations may be based on research read by authors indicating that more references are related to higher quality work so authors are adding references to convey that notion or the expectation may be conveyed by publishers and reviewers who believe in this conclusion.

Changes in the Average Age of References

One broad conclusion is that the average age of references is unrelated to the edition of the text. At best, only 2.5% of the variance in the average age of references was explained by the edition number. The expectation, however, was that earlier editions would have a lower average age for two reasons. First, most editions in the data (71.8%) were published after 1997, making it easier for the authors of these editions to use the internet to find more recent references. Second, for later editions, the expectation was that authors would keep older references because they were seminal in the field or because authors limited the amount of effort expended to update the title. The cubic fit line suggests these forces may be acting but the explanatory power is so low to be of little use. Even restricting the data to post-1997 editions did not change this conclusion.

A second broad conclusion is that as the copyright year increases, the average age of references increases. The best model chosen to represent this relationship explains 14.7% of the variance in the age of references. This model was a linear regression line using individual copyright years and summary data. This relationship was not seen when raw data were used because the small number of references used in some books with a high average age was overshadowed by books with a large number of references with a low average age. Generally, editions published more recently have a higher age and also more references.

The search practices of authors affect the age of their citations. If an author finds a reference and then uses the bibliography of that reference to find related works, the related works will be of an older age resulting in the average age of citations to be older. On the other hand, if an author uses a citation index, related references will be more recent.

In contrast, Line and Sandison (1974) argue that if there is growth in the amount published over the years, researchers will have more recent material to pull from and, therefore, the average age of an author's references should decrease. It seems this would be the more powerful force, especially when coupled with the idea that not only is there more material to pull from but this more recent material is easier to access due to the internet.

Line and Sandison (1974) also report that there is a 6-12 month delay between an author reading a citation and citing it. This delay is longer for foreign material. Thus, if a book relies on foreign material, there will be a greater average age of the author's references. This explanation probably has little effect on the age of United States introductory public speaking books because almost all of the references in these books are not based on foreign material.

Changes in the Type of References

The main findings of the analysis of types of references deal with variability in the distribution of types of references from 1970 to 2018 and the variability in the mix of types between authors. This analysis focused on six broad categories of references: Books, journals, internet, magazines, newspapers, and other. The analysis of categories across time looked at the entire period from 1970 to 2018 as well as the mix of references since the introduction of the internet.

The mix of references changed for every type. Books saw a decrease from 52% to 40% in the share of the mix when pre-1997 references were compared to post-1996 references. The decrease in book references (12.3 percentage points) nearly matches the increase in internet references (12.2 percentage points). Nevertheless, although a significant relationship exists between the number of book references and the copyright year, little of the variance in the

number of book references is explained by the copyright year. The most variance explained by any analysis of a time period or definition of "book" was 5%, explained references to books, chapters, and books found on the internet for the years 1970 to 2018. Analyses of shorter time periods (pre-1997, post-1996), different fit lines, and different material included in the book category explained only 1.6% of the variance at best.

Journals experienced an increase in use over time from 19.1% for pre-1997 editions to 24.7% of the mix after 1996. A cubic fit line to a scatter plot of the data from 1970 to 2018 explained 18.9% of the variance in the number of journal references per 100 pages. This relationship was found to be significant ($p < .001$). The amount of variance explained was less when only post-1996 data were included ($r^2 = .141$).

Magazines were used less from the pre-1997 time period to the post-1996 time period, dropping from 12.9% of the mix to 10.1% of the mix. A cubic fit line of the data for the entire time period explained 4.8% of the variance in the number of magazine references per 100 pages but a linear fit line only explained 0.6% with a nonsignificant correlation between the number of magazine references and the copyright year ($p = .313$). The linear fit line for post-1996 data, however, produced a negative slope that explained 6.0% of the variance in magazine references per 100 pages and was significantly correlated to the copyright year ($p = .005$).

The percentage of newspaper references in the mix increased from 2.6% to 5.9% from the pre-1997 period to the post-1996 period. A cubic fit line to the data explained 6.5% of the variance in the number of newspaper references per 100 pages of an edition for the entire period. Shorter time periods and more inclusive definitions of the newspaper categories explained lesser amounts of variance. A linear fit for all time periods explained 5.5% of variance and was

statistically significant (p = .002). When any form of a newspaper reference was included and the analysis limited to post-1996 data, a linear fit explained only 4.0% of the variance although this result was still statistically significant (p = .022). A cubic fit for this shorter time period explained 4.3% of the variance in the number of newspaper references per 100 pages.

Other references increased from 2.5% of the mix in pre-1997 editions to 6.6% of references in post-1996 editions. Nevertheless, the relationship between the copyright year and the number of other references was not significant.

The strongest relationship between the copyright year and the type of reference was found for internet references. The strongest relationship was found with a cubic fit to raw data using all versions of internet references. In this case 47% of the variance in the number of internet references was explained by the copyright year. Linear fit lines using raw data with and without outliers as well as summary data with and without outliers plus various definitions of the category resulted in an explanation of between 28.1% and 46.7% of the variance in the number of internet references with all results being statistically significant ($p < .001$).

The findings about the mix of references confirm that over the years before the internet, authors maintained stable patterns in the type of references they used. The internet changed these patterns with more and more internet references substituting for other types of references. Journals found on the internet are easy to find so their increase benefited from the introduction of the internet as did newspaper and other references. Books, on the other hand, are not readily searchable on the internet so have suffered a decrease in use in introductory public speaking books.

The second main finding about the types of references used in various editions of public speaking books is that there are significant variations in individual author's mix of types. Although there are trends for an individual author, there is no general pattern that all authors follow. In particular, the introduction of the internet has added more variability to the data since internet references take away from the other types and these internet references are increasing in number every year but at different rates for authors.

Implications for Research

Implications for research cover the three research questions of this investigation. First, bibliometric research on the number of references in publications can be informed by this investigation. Second, this investigation has implications for bibliometric research examining the extent of change in the age of references. Finally, this investigation has significance for research on the type of references used in publications.

Research on the Number of Citations

At a broad level, research on books avoids some of the issues associated with conducting bibliometrics on scholarly journal articles. First, effects of the order of an article on the number of citations it receives in a particular issue of a journal do not exist when examining textbooks since the material in a textbook does not compete with other material in the same publication. This belief assumes that introductory textbooks are cited frequently, which is a questionable assumption, but would be less of an issue with more advanced textbooks such as those written for graduate-level classes or beyond. Second, effects of greater availability on the number of citations a work receives are less pronounced with books compared to journals. Journals vary in

whether they are indexed and if articles in them can be downloaded. On the other hand, at best, only excerpts of books can be accessed from *Google Books* and few books are indexed although this issue is changing with the development of the *Book Citation Index*. Because most books have the same degree of availability, this would not be a variable in the number of citations to a book. Third, effects of the type of material on the number of citations may be reduced with books. For scholarly journal articles, the content of the article may involve original research, a review of the literature, or methodological reports. Scholarly books and especially introductory books are much more limited in their focus.

Hyland (1999) found differences across seven disciplines in the number of references used per 1000 words. Based on this research, his findings may need to be revised to account for the introduction of the internet. Hyland's research was published just three years after this research indicated textbook authors began using the internet with this use producing a steady increase in the number of references used. Figure 7 illustrates the mean number of references per 100 pages in editions grouped into 5-year periods. Customs of the past may no longer be the current custom.

More recent research by Hooper, Wordofa, and Gibson (2017) found 65.9% of the variance in the number of references in psychology journal articles was explained by the length of the article in pages. The 32,878 references included in their study is comparable to the 43,094 references included in this research, however, only 4% of the variance in the number of references in introductory public speaking books was explained by the number of pages. It seems likely that part of the difference between the two results is due to the works examined (journal article versus textbook) and the field studied (Psychology versus Communication).

Chan's (1999) study of Korean Studies journals found that articles that used bibliographies had fewer references than articles that used footnotes. This research found similar results with introductory public speaking books. As shown in Figure 13 and Figure 14, the mean number of references per 100 pages was greater for editions that used footnotes compared to those editions that used a bibliography. The difference between the number of references per 100 pages was found to be statistically significant.

Research on the Age of References

Based on Zipf's (1949) principle of least effort which states that authors will only revise a text to a certain point and Coleman's (2001) explanations of how aging in introductory psychology books occurs, the expectation was that as a title went into subsequent editions, the average age of references would increase. In contrast, this research found little effect of the edition on the average age of references. Figure 18 shows a scatter plot of these data with an indication that only 2.5% of the variance in age is related to the edition.

One possible explanation of why this research found no relationship between the edition and the age of references is that the introduction of the internet allowing easier access to material and the growth in the amount of literature has made it easier for authors to update each edition. Given that the use of internet references is still growing, one speculation is that the increased use of up-to-date references from the internet is counteracting the effects that would normally age an edition's references.

Further confusion about the relationship between the edition and the age of references is created by the finding of a long-term trend toward an increase in the average age of references. Table 14 shows the average age has been consistently increasing since the 1994-1998 time

period while Figure 21 shows a scatter plot of these data. A linear fit line to the data shows the copyright year explains 14.7% of the variance in the age of references and that the average age has been increasing over time. One possible explanation of this confusion is that a large number of published titles have gone through multiple editions.

The distribution in the age of references found in introductory public speaking textbooks fits the limited findings for other textbooks. Research by Coleman, Fanelli, and Gedeon (2000) only reported on the percentage of references that were not more than five years old so comparisons to that research are limited. Nevertheless, the 23.2% of references that were five years old or less in introductory psychology textbooks published from 1952 to 1972 closely matches the approximately 25% of references in the same five-year span for introductory public speaking textbooks. On the other hand, the decreasing percentage of references in the zero to five-year range that they found does not match the data for this research. Whereas they found the percentage of references less than six years old went from 23.2% in the 1952-1972 period to 15.2% for 1973-1982 textbooks to 10.5% for textbooks published 1983-1995, this research found no such pattern. Instead, the percentage of references in the 0-5 year old category remained stable. A much better fit was found when comparing this research with that of Griggs, Proctor, and Cook (2004). Their analysis of introductory psychology textbooks found 43.8% of references were 0-10 years old, a percentage within the 43.1% to 58% range for the introductory public speaking books of this research. For references 0-20 years old, Griggs, Proctor, and Cook found 70.1% of reference fell into this category while this research found 70.1% to 77.4% of references did the same, depending on the five-year period studied. For references 0-30 years old, Griggs, Proctor, and Cook indicated that 83.3% of references fit this category while this

research revealed that 80.6% to 86.9% of references matched this age classification. With more studies using introductory textbooks in related fields, perhaps a meta-analysis could confirm a pattern.

Research on the Type of References

Various researchers such as Mahapatra (2009) argue that in Science and Technology fields, journals are the most frequently used type of reference while in the Social Sciences and Humanities, books occur most frequently in reference lists. This research supports that finding to some extent. This was certainly the case before 1997 with introductory public speaking books since all 14 titles that had editions in this time period used references to books more than references to journals. In general, as shown in Table 22, 52.6% of references were to books and 19.2% were to journals in editions published before 1997. As shown in Table 20, however, books are not as dominant in the references of the most recent edition of the 28 titles examined in this research. Overall, as found in Table 20, in the most recent edition of each title, books constitute 35.3% of references, journals equal 27.6% of references, and internet resources total 21.6% of references. While books still dominate, there is a clear decrease in their share of all references. In addition, the rankings of different types of references was not unanimous. In three editions, internet sources are the most used reference. In twelve editions, journals are not the second most common type of reference but internet sources are. As a result, the introduction of the internet is challenging the claims made in a 2009 book that, although only nine years old, may already be very out of date.

Not only does this research provide evidence that the distribution in the type of references is changing over time, it suggests that the distribution in the type of reference changes depending

on whether the publication is an introductory textbook or a journal article/book chapter. Gao's (2015) research on the distribution in the type of material used by University of Houston communication faculty in journal articles or book chapters published between 2006 and 2014 found that 59.4% of references were journals, 29.6% were to books, and 4.7% were web references. In contrast, for the most recent edition of introductory public speaking books, 27.6% of references were to journals, 35.3% to books, and 21.6% to the internet.

Implications for Practice

In this section implications for practice are discussed. Findings of this research are relevant to students, faculty, institutions, publishers, national associations, data repositories, journals, and used book sellers. Faculty members affected include users of a textbook, bibliometric researchers, and authors of textbooks. Institutional units affected include bookstores, student services, and educational affairs.

Implications for Students

Based on this research, changes in the number, age, or type of references from one edition of introductory public speaking textbooks to another occurs in patterns that indicate dramatic change does not occur from one edition to the next. As a result, students will generally find that buying a previous edition of the introductory public speaking textbook will suffice for most purposes of a public speaking class. Purchasing the previous edition, however, would substantially save money for the student, resulting in them buying a book in the first place or staying in school. One exception to this involves textbooks linked to other publisher resources such as assessment tools offered in conjunction with the textbook.

Implications for Faculty

Faculty members affected include users of a textbook, bibliometric researchers, and authors of textbooks. The greatest number of these would be users of textbooks. The next greatest effect might either be for faculty who conduct bibliometric research or for those who author introductory textbooks depending on how many of each there are. Such numbers are not readily available and are likely to change over time.

For users of an introductory public speaking textbook, some faculty may perceive the change in the age, number, and type of citations as indicating that a new edition does not need to be adopted immediately. This perception would be especially the case for the age of references if references are kept from one edition to the next because they involve seminal works in the field, primary sources, or reports on an historical event made at the time of the event. A judgment that resulted in using an older edition for a longer time would allow the faculty member to avoid time spent updating classroom material such as lectures or tests and use the time for other activities such as service to the college or publishing. Using an older edition would also save students money since cheaper used editions are available for older editions but not for the newest one. In fact, if some faculty switch to the new edition and others do not, that would lower the price even more since there would be less demand for the used copies. Lower textbook costs make it more likely a student will purchase the book and be able to afford attending an educational institution in general. Institutions might promote classes that follow this philosophy of using low-cost older editions, thus increasing enrollments in particular classes or in the entire institution. A final implication for users of a textbook is that this research could provide another tool to use in evaluating the quality of a book considered for adoption.

Use of an older edition has limitations. Two such limiting forces are technology and culture. Both forces have already produced changes and more may be forthcoming. Faculty who teach from a particular text must weigh the need for change against the disadvantages of switching to a new public speaking text.

Technology may make the need to adopt a new edition more urgent. The introduction of the internet resulted in introductory public speaking textbooks revising chapters on library research. Presentational software such as PowerPoint caused authors in some cases to add a full chapter on how to use the software. Recording technology may have led authors to address anxiety about being recorded to textbooks or to cover issues of delivering a speech via the technology. Supplemental material tied to a new edition may provide a further impetus to adopt a new edition. This material may include on-line assessment material, digital copies of the text, links to videos, an electronic grade book, and computer server space to store and evaluate speeches by both the teacher and the student.

Cultural changes may put pressure on a teacher to adopt a new edition. The culture of the Communication field as well as the general culture of society could exert such pressure. In the Communication field, there have been calls to add more material related to diversity and civic engagement over the years and several textbooks have responded to these calls. Societally, there is a need to make examples current and relevant to students. Former president Richard Nixon's Checkers speech or Vietnam War examples would not resonate with current students like the Black Lives Matter movement or Stoneman Douglas High School student speeches on gun control.

For faculty who conduct bibliometric research, this research serves as a pointer toward a fertile field of research. Researchers may be from the Library Science field or they could be interested in practices in specific disciplines. In either case, the research could be published in journals specializing in bibliometrics or in journals for a particular discipline.

Authors of textbooks should be aware of the issues raised in this research and the demands that may be placed on them as a result. Textbook users, for example, may use the data in this study to scrutinize the age, number, or type of references and demand more recent, greater numbers, or different types of references. Textbook authors may take on the challenge on their own, perhaps due to being unaware of their referencing patterns or having a desire to improve upon them.

Institutional Implications

Institutional units potentially affected by this research include bookstores, auxiliary services, libraries, and educational affairs. In the case of bookstores and student services, the effect is financial. In the case of educational affairs, the effect is on policy.

For bookstores, faculty who decide to continue or start using an older edition deprive the bookstore of income. Since bookstore income typically is based on the amount of markup for books, when a book is cheaper, the markup produces less revenue. Previous editions tend to be cheaper than the latest edition and use of a previous edition allows for the sale of used copies which are also cheaper.

As a result of a decrease in bookstore revenues, student services and may also be affected. At some educational institutions, bookstore profits may be used to support student

services like athletics, child care, or a women's center. With lower bookstore profits, these services would need to find other sources of revenue or face a cutback in what can be offered.

For libraries, this research may affect acquisition and retention policies. Conducting bibliometric research on introductory textbooks used at educational institutions can uncover key material used in these books that would be needed to write such a book or that would be useful in related research. In terms of retention policies, if there is only marginal differences between one edition and the next, libraries could save money by not replacing the previous edition with the latest one and not affect the education of users.

For educational affairs, activities directed at decreasing textbook costs for students could be supported by this research. Using an older edition could be one strategy an institution encourages faculty to use to decrease costs. Promotion of textbook cost-reduction strategies could be a marketing tool for the institution.

Implications for Publishers

Publishers may use this information in many ways. Perhaps the most likely way is to use it to market their book. Publishers could use the data to show a particular title has more references, newer references, or better references than other titles. A textbook could also be marketed as having fewer references that overwhelm students, uses seminal research in the field, or pulls from a variety of sources. A second response might be for publishers to respond to textbook cost issues by publishing less frequent updates and making the updates more extensive when they occur. Third, these data can be used to satisfy legal requirements that substantial changes were made to the textbook.

Certain publishers could greatly assist research of this type by expanding reference tools. Currently, the *Book Citation Index* does not cover introductory books but, if it did and the information was in usable form, scholars would find it much easier to conduct research. If the index is expanded, it would be important to include each edition of a book.

Implications for National Associations

To facilitate research of this nature, rather than relying on publishers to produce the necessary reference works, national associations might be called upon to compile and maintain all editions of books in the field. They could also archive marketing information provided by publishers that includes information on the national ISBN, the suggested price, the number of pages, and the copyright date of the book. This approach would make it easier for researchers who belong to the association to conduct a bibliometric investigation since they would not have to scour bookseller's sites and libraries seeking the needed material.

Implications for Library Systems

Rather than place the burden on national associations to create and maintain a repository of material, it could be left to a library system to do so. One possibility is the Consortium of Academic and Research Libraries in Illinois (CARLI). Another option is the Center for Research Libraries (CRL) based in Chicago.

Implications for Journals

This research has two implications for journals. First, existing journals could issue a call for bibliometric research on books, especially introductory textbooks. Second, a new journal could be launched to investigate the bibliometrics of books.

Implications for Used Book Sellers

If faculty decide to continue using an older edition or if students decide to do so despite the adoption of the latest edition, used book sellers may see the market for older editions increase. Typically, once a new edition is published, the market for the older edition dries up quickly. This outcome may change so used book sellers may want to hold onto older editions longer.

Future Research

A variety of suggests for future research are made in this section. Some suggestions involve finer examination of the data while other suggestions identify broad topics. The suggestions include analyzing references used in more detail, adding a variable to the research, identifying patterns of reference use, describing the process of revision in more detail, and general statistical issues.

Analyzing Changes in References in More Detail

This research conducted here did not examine individual references to determine how many of them changed. It is possible that every reference in a book was changed or that all the previous references were kept (or some version of them such as the same quotation but in a new edition) and a few new ones added. Future research could analyze the number, age, and characteristics of references that were actually added and deleted.

Analyzing References Used in More Detail

In order to evaluate what individual references were added or deleted, a database of all references used in all textbooks would be needed. Such a database could also be used to determine what common references are used across textbooks. The original intent of this research was to compile such a database but the amount of time required quickly resulted in the project being scaled down.

Additional analyses of internet references could also be conducted. It might be interesting to assess which authors used non-web page internet sources and when they started using these sources in order to gauge which authors were early adopters of electronic reference sources. Analyzing the types of non-web page internet materials that were used the most could be coupled with this analysis, especially if information was added to the analysis on the date of introduction of the electronic database. Finally, the results presented in this research depend on the time frame selected for evaluation. The assumption made was that the first date that any author used an internet resource was the date that all authors could have used internet references. Relaxing this assumption to include only editions in which an internet resource is used, would change results.

Adding the Publisher as a Variable

One variable that was not considered in the analysis was the publisher. As part of the process, publishers can exert influence over content, either directly via an editor or indirectly via the process used to inform authors about market demands. To address this issue, multilevel modeling could be used, treating the edition as a level 1 variable, the title as a level 2 variable, and the publisher as a level 3 variable. One difficulty with facing this analysis would be that publishers merge, change focus, or go out of business over time. According to Greco, Milliot, and Wharton (2013), "between 1960 and 2012, there were approximately 1,700 mergers and acquisitions in the U.S. publishing industry" (p. 98). Despite this change in the industry, there was a "dramatic increase in both the total number of book publishing firms and title output between 1960 and 2012" (p. 99). Second, even in a stable publishing firm, the staff often change, which may further confound the ability to determine the effect of a publisher and its staff. The turnover rate for junior personnel is "staggering" and "among midlevel employees, it is almost as high" (p. 147). Third, such an analysis would require each publishing house to have published multiple textbooks on public speaking.

Analyzing the Effect of the Date of the First Edition

Authors tend to cite the research they are most familiar with. Journal article authors are more likely to cite their own work (Larivière, Sugimoto, & Bergeron, 2012), work authored by members of their peer group (White, 2001), and work they studied during graduate school versus work from other time periods (Barnett & Fink, 2008). Once authors write a book, that familiarity can influence their decision to keep the same references in the book during subsequent revisions

which serves as a benchmark for the number and age of references in future editions from which incremental increases are made. Including the date of the date of the first edition, then could be a variable added to future research.

Characterizing Patterns of Citation Use

Unlike bibliometric analyses of journals that focus on patterns of citations to a particular article, bibliometric analyses of books offers more avenues of research into patterns of citations by a particular edition or a series of editions. One avenue of research involves determining the conventions about what is acceptable to cite in a publication. These conventions differ between journal articles and textbooks so existing research about journal articles may not apply to textbooks. Citations in journals tend to be to other journal articles with some references to books and perhaps a few to recent conference papers. In contrast, citations in books, especially introductory public speaking books, include a greater range of material including newspapers, oral presentations, newsletters, internet pages, magazines, and personal emails. A second avenue is created by the ability to analyze patterns of citation use with each revision of a book whereas that ability is severely limited with journal articles. Earlier versions of a journal article are sometimes available such as when an article is based on a dissertation, a conference paper, or in unique cases where drafts submitted for publication can be accessed. However, changes in the age, number, and type of references are likely to be limited with fewer references in the case of a journal article based on a dissertation and limited changes in the case of an article based on a conference paper or an earlier draft.

One future avenue of research, then, is to characterize an author's or a field's use of this broader range of material either in terms of a single edition or in terms of changes from one

edition to another. Authors or their textbook could be characterized as local or global in their pattern of citation use. The textbook by Ross (1983) has elements of a local pattern of citation use as indicated by its use of dissertations and theses from the author's institution, journal articles from the author's state association journal, area newspapers and speeches from students at the author's institution. In contrast, global citation patterns would be indicated by the use of dissertations from multiple institutions, national or international journals, national newspapers, and published speeches. Another pattern of citation use could be characterized as networked or generic. A networked pattern would include more in-press books or in-press journal articles, unpublished data, consulting experiences, and conference papers which would suggest close connections with on-going research in the field. A generic citation pattern would more heavily include citations readily found through search tools. As another example, in an unpublished analysis by this writer of the six editions of Malcolm Knowles book *The Adult Learner: A Neglected Species*, essentially no citations were deleted from one edition to the next, making him what could be characterized as a citation hoarder. On the other end of the continuum might be a citation divorcer who quickly updates references in a book. As a final example, "citation ignorer" could characterize *The Speaker's Handbook* written by Sprague and Stuart since the nine editions of this book include citations ranging in number from 38 to 58, many fewer than the average 243 citations for all books in this study while, on the other end of the continuum, "citation fanatic" could characterize the 623 citations in Coopman and Lull's (2018) textbook.

Analyzing the Process of Creating Textbooks

The revision history of journal articles is much more limited than that of textbooks that are published in multiple editions which provides an opportunity to characterize the revising behaviors of specific authors. For journal articles, prior versions are sometimes available if the article was based on a dissertation, if a previous version was first presented as a conference paper, or if the article was published as a working paper. Some journals also chronicle the publishing sequence of an article including its submission date, revision date(s), and acceptance date. In contrast, textbooks published in multiple editions provide a consistent, extensive resource to examine revising behavior. To this published material, drafts submitted to reviewers could be added to provide further detail for analysis.

Investigating Copyright Dates versus Publication Dates

Two issues noted in this study are that the copyright date may not be the same as when an edition is actually published and the practice of using a copyright date a year or more in the future may be an ongoing practice or a recent one. To make this determination, interviews with authors and publishers could be conducted. Such interviews might be very revealing. For example, it is certainly likely that, due to technology related to word processing, emailing, and printing manuscripts, the period between final draft and publication does not have to be as long now as it did years ago (e.g., in 1970 when the earliest edition included in this study was published). As a result, publishers can provide examination copies to potential buyers much sooner than in the past.

Establishing Standards for Effect Sizes in this Field

In assessing effect sizes for correlations, benchmarks developed by Cohen (1988) were used in this study. Research by Bosco, Aguinis, Singh, Field, and Pierce (2015) in the field of psychology argues that these benchmarks may be field specific. The limited amount of research on books or introductory college-level textbooks generally, and public speaking textbooks specifically, prevent such benchmarks from being developed at this time but future research could pursue this avenue as more research is conducted.

Study Limitations

Limitations to this research fall into four areas: The data, the analysis, the scope, and the explanation. First, issues with the data involve missing editions of a title, titles not included in the data, and overcounting or undercounting of references. Second, regarding limitations of the analysis, better data analysis tools could improve the results. Third, the scope of the research is naturally limited due to the immense number of books published. Finally, this research did not deeply delve into explanations of why authors used the references contained in each edition. Each of these is covered in more detail in the following sections.

Limitations of the Data

Data limitations involve missing editions of a title, titles not included in the data, and overcounting or undercounting of references. In the case of missing editions of a title, the cause was the inability to find the edition. In the other cases, the limitation was by design.

For three books, certain editions were not included in the data. In the case of the title by Ross, five editions out of fourteen could not be located (1st, 4th, 5th, 8th, and 9th). Searches on Abebooks.com, Amazon.com, and Worldcat.org failed to find these editions. The possibility of contacting the author was considered until it was learned that he was deceased. In the case of the title by Valenzano and Braden, two copies were located that appeared to be the first edition but they could not be definitively identified as such. Editions before the 6th by Monroe were located but not included since they were published before 1970, the cutoff date for the study. Conclusions about the title by Ross are, therefore, limited, especially about the early editions although conclusions about referencing patterns for the last five editions would be valid. Since Valenzano and Braden have only published three editions of their book, conclusions about their referencing patterns would also be limited. Conclusions specifically about Alan Monroe cannot be made because only one of the editions of his title was published while he was alive.

Twenty-eight titles were included in this analysis but there are many more published. The table in Appendix A lists 67 titles that researchers investigated for various studies of introductory public speaking textbooks and this research uncovered 161 from which the 28 were selected. Given the variability in the data for some of the analyses, a larger sample would be useful in some areas. For example, few of the titles used footnotes so conclusions about books with footnotes should be considered cautiously. There is also the possibility that the sample may not contain titles from small publishers or less popular texts since there would be fewer copies printed which would decrease the likelihood that they would be available on book sales web sites or be purchased by a library and be entered on WorldCat.org. Data on the number and age of citations did not include titles with only one edition so results cannot be generalized to all texts.

The method used to include a reference in the data may also result in overcounting or undercounting. Titles that used an end-of-book reference list had references counted only once. Titles that used an end-of-chapter reference list could potentially have references counted multiple times, once for each chapter. Three titles were initially coded in a way that allows this effect to be assessed. In the tenth edition of Gregory (2013), the total number of references would have increased from 147 to 155. In the sixth edition of Beebe and Beebe (2006), the total number of references would have increased from 440 to 461. In the seventh edition of Lucas (2001), the total number of references would have increased from 214 to 232. Thus, overcounting may be in the range of 5-8% for books with end-of-chapter reference lists or, conversely, books with end-of-book reference lists could have the number of references under counted by 5-8%. Since a footnote to a reference was only counted once per chapter, a similar effect could exist in titles that used footnotes.

Additional problems with counting references come from other sources. Photo credits were not counted. Recommended resources were not counted. Some authors included references used in sample speeches in the references for the book while other authors did not follow this practice. In a few cases, material such as quotations was cited in the text but not in the bibliography.

Limitations in the Analysis

Regarding limitations of the analysis, better data analytic tools could improve the results. The exploratory work done here suggests possibilities for a multivariate analysis or a hierarchical analysis. A multivariate analysis could simultaneously evaluate the effects of the copyright date, the edition number, and whether footnotes or a bibliography was used. A hierarchical analysis

could add to this an evaluation at the raw data level, at the edition level, and at the book title level thus allowing effects at different levels to be identified. In both cases, variance can be better allocated to causes.

Limitations to the Scope of the Research

This research began with an interest in all books which was narrowed to introductory textbooks, which was further limited to those in communication with a final focus on introductory public speaking textbooks. In addition, the time period was restricted to 1970 to 2018. Because of the ancient tradition and stable characteristics of effective public speaking, public speaking books are unlikely to exhibit the same bibliometric characteristics as newly emerged and more dynamic fields of communication such as interpersonal communication, intercultural communication, small group communication, or health care communication. Introductory textbooks in these other communication areas would have different results and other disciplines perhaps more so. In addition, a study of advanced, upper level, or graduate-level books would also be expected to be different.

Linking the number, age, or type of reference in a textbook to quality measures was not feasible for this research. First, using the popularity of a textbook as a proxy for quality was not possible because of the difficulty of finding sales information. Two requests emailed to Nielsen for these data did not produce any response. Ranking data from Amazon.com is based on a limited number of sales (less than 1500 books), is distorted since every edition of a book sold through the site is part of the ranking, includes non-academic books in the ranking, and includes books that do not deal with public speaking such as books on small group communication. Publisher data are proprietary and would only be available for books issued by the particular

publisher. Since educational institutions must make available ISBN numbers of textbooks used in a course, some research was conducted that involved accessing each institution's bookstore web site and college catalog to get the course number for the basic public speaking class and then search the bookstore website for the book used in each section of the course. This very time-consuming process was not pursued in this research but could be used in the future.

A second quality measure would be awards bestowed upon a public speaking textbook. Few such awards exist. Rothwell's (2017) second edition, for example, was one of 26 books to receive the 2018 Textbook Award by the Textbook & Academic Authors Association (Schmeider, 2018) while the eighth edition of Lucas (2004) garnered the award in 2004. Since 1994, these are the only two introductory public speaking books receiving the award, making it difficult to compare editions that won the award to those that did not. In addition, in order to be considered, a $350 nomination fee must be paid and four copies of the print book must be provided so some authors may not submit their book for consideration.

A third quality measure would be citations to the textbooks. Very few such citations occur so this measure has limited usefulness. Research on introductory public speaking books provides some indication of which books researchers consider deserving of investigation but the choice of books to study, as indicated by Table 1, tended to involve methods that were not based on quality. In addition, the 16 studies cited in Table 1 spanned a 30 year period and the most recent one was published in 2010 creating problems with the currency of the information.

The credentials of the author could be a quality measure. Much like the bibliometric research on journal authors that argued that top researchers produced papers with more references thus proving that more references was a sign of quality, extensive publication in major

journals by authors of public speaking textbooks could be an indicator that the textbook is of equal high quality. The length of an author's career, plus measures of journal quality and article quality would need to be considered to assess this.

Limitations in Explaining Bibliometric Behaviors

This research did not deeply delve into explanations of why authors used the references contained in each edition. Interviews with authors could provide answers although there are challenges to this approach. Access would be geographically difficult since authors seem to be dispersed across the United States unless they are interviewed at a convention that many of them attend. Some authors are deceased. A decision would have to be made about whether to interview multiple authors separately or in a group setting.

Besides interviewing authors, editors at publishing companies could also be interviewed. They could disclose publisher policies relevant to the choice of references. Tracking down editors could pose problems since turnover in the industry exists and editors may be unwilling to disclose this information.

Some information might be gleaned from the preface of the book or promotional material that explains the uniqueness of the book. Since federal and state laws require that adoption of a new edition involve substantial changes over the older edition, the preface or promotional material may contain useful information. This information is likely to be limited in detail, however.

Predictions of the Future

Continued research along the lines presented in this work assumes authors will continue to write clearly defined textbooks revised on a regular schedule, publishers will still be able to market the book, teachers will continue to select the books used in the class, and students will learn from books required for the course. All of these assumptions have already been challenged and additional challenges are foreseeable. The effect of the internet, artificial intelligence, big data, and politics are four forces that could create a revolution over current textbook related practices.

The internet already offers a venue for textbooks. This venue, however, can be expanded to obfuscate the type of research conducted here. In the field of communication, the *Public Speaking Project* web site offers a free online textbook as well as supplemental material for instructors. With textbook prices rising, educational institutions are likely to continue moving toward such open educational resources (OERs). At a suburban Midwest community college, faculty are granted release time to develop and use OERs and several courses with large enrollment have already moved to the use of OERs. Publishers, understanding the threat of OERs, have developed ancillary materials offered only on their web site with the purchase of a book to add value beyond what OERs currently provide. These ancillary materials include a variety of assessment tools, proprietary sample speech videos, plus speech recording and storage technology which allows for more sophisticated evaluation by both teachers and students.

These movements affect bibliometric research in several ways. First, the ability to continually update material will make it difficult to date the material. If the material can be dated, the potential number of revision dates can be overwhelming. Second, authorship issues

occur. In the case of the *Public Speaking Project*, each chapter is authored by a different person. If a wiki model of creating an introductory public speaking textbook were followed, there could be hundreds of authors and perhaps only one book used by all teachers of a subject. Third, the internet can allow the length of a book to be unfettered. Material can easily be linked to other material on the internet allowing students to pursue topics beyond the intended textbook material. The linking ability of the internet can also allow each teacher to choose the extent of surfing that they want students to pursue, making the definition of a book vary based on the teacher's choice of links rather than the author's choice of content. The definition of 'book' becomes confounded.

One of the biggest technological pushes currently occurring involves artificial intelligence (A.I.). Current news stories involve the use of AI to drive cars, fly planes, make medical diagnoses, and recognize faces. A.I. work has been applied to teaching for decades. For example, Lesgold, Lajoie, Bunzo, and Eggan (1988) describe a coaching program to help Air Force technicians with troubleshooting. A.I. software could conceivably replace teachers in the classroom. The material from which the software would learn could be easily gathered. In the case of communication, rubrics for grading speeches already exist. Publishers have access to previously graded speeches because most publishers provide a storage system that allows students to self-evaluate and instructor to grade the speech. Information in numerous textbooks and journal articles on public speaking could easily be fed into the system because most of the material is currently available electronically. A.I. software would then possess more knowledge than teachers, would be an objective and consistent grader of speeches, and be able to adapt to individual student needs. Textbooks would no longer be needed.

Another popular term in the media is big data. As more data are converted or created in electronic form, the ability to explain, predict, and control the world increases as this information is processed by powerful computers. For example, in the communication department of a Midwest community college, data on public speaking anxiety and scores on common exam questions exist. This information could be combined with demographic and academic information gathered by the educational system since kindergarten to explain a variety of educational outcomes. Adding medical records including D.N.A. profiles could account for genetic factors in learning. Other environmental influences on educational outcomes could be explained by data from social media, financial information from financial institutions or the I.R.S., and purchase histories generated by *eBay*, grocery store loyalty cards, and *Amazon*. The expectation is that education can then be tailored to the individual, each with a unique set of instructional materials rather than expecting a textbook to serve the needs of large numbers of students.

Technological change will naturally lead to political involvement. The federal government and states have already passed laws requiring updates to college textbooks to be substantial revisions. In addition, for textbooks used in high school or earlier, many states already dictate textbook selection. According to Zinth (2005),

> "a total of 20 states – known as textbook adoption states – choose at the state level what text books can be used by all districts. California is an adoption state at the elementary level but allows local agencies to select textbooks at the secondary level. Two U.S. territories, the Virgin Islands and Puerto Rico, adopt textbooks at the territorial level. Washington, D.C. is comprised of one school district and adopts textbooks at the district level.

Some states have allocated funds to encourage the development of OERs. Student protests against the high cost of textbooks could add more action in this regard. In the not-so-distant

future, perhaps states will mandate that robots teach constantly updated, individual material to students, making printed textbooks, publishers, and faculty obsolete.

Concluding Thoughts

Little research has examined the references used in books in general, and in introductory textbooks in particular, especially how these references change from edition to edition. No such research on the references used in introductory public speaking textbooks could be found by this author. The opportunities, then, are immense for researchers interested in this field to explore the subject and break new ground. Corporations like Clarivate Analytics could also expand by providing data in this field. If the literature on the bibliometrics of journals is any indication, the possibilities are huge.

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APPENDICES

APPENDIX A

TEXTBOOKS USED IN RESEARCH ON PUBLIC SPEAKING TEXTBOOKS

	Research on Public Speaking Textbooks														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Andrews		1987							1987						
Ayers & Miller		1986							1986						
Barrett		1987							1987						
Beebe & Beebe	2006		2003			1997		2003		2009	2003	2003	1991	2009	
Bostrom									1988						
Bradley									1984						

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Brilhart, Miley, Bourhis, & Berquist		1991													
Brooks		1980													
Bryden & Scott			2003					2003			2003	2003		2008	
Busby & Majors		1987							1987						
Byrns									1985						
Capp, Capp, & Capp									1986						
Carlile & Daniel		1987													

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Coopman & Lull														2009	
Dance, & Zac-Dance		1986							1986						
DeVito		1987			2006								1990	2009	
Ehninger, Gronbeck, McKerrow, & Monroe													1982		
Engleberg & Daly														2009	
Ferguson	2008				2008										
Fletcher													1990		

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Foss & Foss					2003										
Fraleigh & Tuman														2009	
Gamble & Gamble				1994, 1999											
Grass-Hemmert														2008	
Gregory		1987	2002					2002			2002	2002	1990	2008	
Grice & Skinner			2004	1997	2007	1998		2004			2004	2004		2007	

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Grice & Skinner			2004	1997	2007	1998		2004			2004	2004		2007	
Griffin	2003				2009									2009	
Gruner							1982								
Gruner							1993								
Hanna & Gibson		1989											1989		
Hasling					2006								1988	2010	

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Heun & Heun		1986													
Hogan, Andrews, Andrews, & Williams															
Hunt		1987													
Jaffe			2001					2001			2001	2001		2010	
Jeffrey & Peterson		1989											1989		
Kearney & Plax						1996									

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Kline					2004										
Koch		1988											1988		
Lucas	2007		2003	1998	2004	1995 1998		2003	1986	2004	2003	2003	1989	2009	
Makay					2000										
Makay, Butland, & Mason	2008														
Masterson, Beebe, & Watson		1989													

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Masterson, Beebe, & Watson		1989													
McCroskey					1997										
McKerrow, Gronbeck, Ehninger, & Monroe; Ehninger, Gronbeck, McKerrow, & Monroe									1986					2007	
Morreale & Bovee				1998											
Mudd & Sillars		1986													

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Nelson & Pearson				1996	2005*								1990		
Nelson, Tisworth, & Pearson	2008														
Nelson, Pearson, & Titsworth					2007									2010	
O'Brien														2009	
O'Hare, Rubenstein, & Stewart					2004										
O'Hair, Stewart, & Rubenstein	2007		2004		2007			x			2004	2004		2010	

(continued on following page)

	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Osborn & Osborn		1988	2003			1999		2003	1988		2003	2003		2009	
Osborn, Osborn, & Osborn	2008														
Peterson, White, & Stephen		1984													
Powers		1987											1987		
Redman & Vrchota					2007										
Ross													1989		

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Samovar & McDaniel														2007	
Sellnow															2003
Sprague & Stewart (compact handbook)					2006										
Sprague & Stewart (handbook)			2003		2008			**	1988		2003	2003			
Taylor		1984													
Tedford													1991		

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Vasile, & Mintz		1989													
Verderber & Verderber Communicate!															
Verderber (Challenge)		1988													
Verderber & Verderber (Challenge)	2003												1991		
Verderber, Verderber, & Sellnow; Verderber, & Verderber; Verderber									1988					2008	

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	Research on Public Speaking Textbooks (continued)														
Textbook author(s)	Adams & Cox (2010)	Allen & Preiss (1990)	Child, Pearson, & Amundson (2007)	*Communication Education* (1999)	Fiordo (2010)	Frobish (2000)	Gruner (1993)	Gullicks, Pearson, Child, & Schwab (2005)	Hinchcliff-Pelias (1989)	McGarrity & Crosby (2012)	Pearson, Child, Mattern, Kahl (2006)	Pearson, DeWitt, Child, Kohl, Dandamudi (2007)	Schneider (1992)	Schneider (2011)	Sellnow, Child, & Ahlfeldt (2005)
Whitman, & Foster		1987													
Wolvin, Berko, & Wolvin	1999														
Wood		1988											1988		
Zarefsky			2002					2002		2008	2002	2002		2008	
Zolten, & Phillips		1985													

*Telecourse version

** Excluded because no photographs

APPENDIX B

TEXTBOOKS USED IN THIS RESEARCH

Beebe, S. A., & Beebe, S. J. (1991). *Public speaking: An audience-centered approach*. Englewood Cliffs, NJ: Prentice Hall.

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Brydon, S. R., & Scott, M. D. (2008). *Between one and many: The art and science of public speaking* (6th ed.). Boston, MA: McGraw-Hill Higher Education.

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Grice, G. L., & Skinner, J. F. (2007). *Mastering public speaking* (6th ed.). Boston, MA: Allyn & Bacon.

Grice, G. L., & Skinner, J. F. (2010). *Mastering public speaking* (7th ed.). Boston, MA: Allyn & Bacon.

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