

## CITATION ANALYSIS OF THE CANADIAN AUTHORED PAPERS PRESENTED AT THE 1990-1994 ANNUAL CONFERENCES OF THE CANADIAN ASSOCIATION FOR THE STUDY OF ADULT EDUCATION (CASAE)

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### **Abstract**

*The purpose of this article is to report on the citation practices and patterns of Canadian presenters at the 1990 to 1994 annual conferences of CASAE. The study identified the most frequently cited authors and publications, explored alternative methods for ranking authors, and critiqued methodologies used in previous adult education citation studies. The research findings were analyzed to identify trends and themes particular to a Canadian context. Though the overall results were similar to those reported in previous studies, differences included: (a) a substantial increase in the number of female authors cited, (b) an increase in the number of Canadian authors cited, and (c) an indication that women collaborate in adult education research and publishing to a greater extent than men. A holistic look at the data revealed an emphasis on reviving or enhancing the adult educator's role as an agent for social change.*

### **Résumé**

*Cet article vise à faire le point sur l'usage des citations et références parues dans les actes des colloques annuels de l'Association canadienne pour l'étude de l'éducation des adultes (ACÉEÀ), entre 1990 et 1994. Notre étude désigne les publications et les auteurs les plus fréquemment cités, explore diverses méthodes pour faire le classement des auteurs, et offre une critique des méthodologies utilisées dans le passé pour analyser les citations et références. L'analyse des résultats permet d'identifier certains thèmes et tendances associés au contexte canadien. Nos résultats appuient les conclusions de certaines études précédentes, et contribuent de nouvelles données. Ainsi, le nombre de femmes est à la hausse parmi les auteurs cités, de même que le nombre de Canadiens; par ailleurs, les femmes semblent être majoritaires dans le monde de la recherche et de l'édition en éducation des adultes. De façon générale, on note une tendance à valoriser le rôle des éducateurs d'adultes en tant qu'agents de changement social.*

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Using citation analysis as a quantitative research method is not a recent phenomenon. According to Budd (1988), documented research involving citation or reference analysis dates back to 1927. Over the years, citation analysis has been used to examine a number of disciplines (Harsanyi, 1993; MacRoberts & MacRoberts, 1989), including fields or subfields related to education. Studies have

been conducted in higher education (Budd, 1988, 1990; Silverman, 1985), instructional development (Sachs, 1984), instructional design and technology (Anglin & Towers, 1992), computer-based instruction (Wedman, 1987), and adult education (Boshier & Pickard, 1979; Field, Lovell, & Weller, 1991; Gillen, 1993, 1994; Kavanagh, 1987).

The purposes for conducting citation analysis research are as diverse as the fields in which the method is used. Published studies have used citation analysis to identify the most frequently cited authors within a field (Anglin & Towers, 1992; Boshier & Pickard, 1979; Budd, 1990; Sachs, 1984; Wedman, 1987), to rank the most frequently cited publications (Boshier & Pickard, 1979; Budd, 1990), to classify the age and types of references (e.g., books, chapters, journals, etc.) or both, found in a field's most prominent journals (Budd, 1990; Silverman, 1985), and to classify references in a selected journal as primary or secondary to their respective field (Boshier & Pickard, 1979). Citation analysis has also been used to cluster writers into invisible colleges: "groups of individuals who are linked by a common set of ideas or a common approach" (Sachs, 1984, p. 8).

### History of Citation Analysis in Adult Education

In comparison with the large volume of published research in other fields (Harsanyi, 1993), there have been relatively few citation analysis studies in adult education. The only study published in a refereed journal that was designed with the purpose of identifying the most frequently cited authors and publications in adult education (Boshier & Pickard, 1979) was conducted over 15 years ago. Since 1979 there have been at least three other studies with the same or similar objectives as Boshier and Pickard's (1979) study. These three (Field, Lovell, & Weller, 1991; Gillen, 1993, 1994) were presented at conferences or disseminated through other means.

There are many possible reasons for the relative lack of interest in conducting citation analysis research in adult education. One reason may be that the relative youth of the field (or, according to many, an emerging discipline) has delayed the development of a large body of primary literature to be examined. Boshier and Pickard's (1979) study noted that the percentage of primary literature citations in *Adult Education (AE)* from 1968 to 1977 averaged 34% and climbed steadily throughout the 10-year period. A more recent study (Field, Lovell, & Weller, 1991) indicated that primary adult education literature accounted for 44% of all citations in *Studies in the Education of Adults* in 1986 and 1990.

Selecting an appropriate mix of journals for a data source may also be a problem. Rachal and Sargent commented that "in adult education, unlike some other fields, there is perhaps greater ambiguity as to what the principal journals are" (1995, p. 74). Another possible reason for the relative lack of inquiry in this area may be that a hierarchical ranking of authors and publications could be considered at odds with the underlying philosophical principles of adult education, in particular, the notion

that dominant structures within the field will continue to be reinforced by the dissemination of such research findings. Naturally, a host of other reasons could be responsible for the lack of research in this area.

Table 1 summarizes the data sources of this study and the four prior adult education citation studies located by the author.

Table 1

Citation Studies in Adult Education which Listed the Most Frequently Cited Authors and Publications

Period	Data Source	Study
1968-77	Volumes 19-27 of <i>Adult Education</i>	Boshier & Pickard (1979)
1978-87	Volumes 28-38 of <i>Adult Education (AE)</i> / <i>Adult Education Quarterly (AEQ)</i>	Gillen (1993)
1986-90	<i>International Journal of Lifelong Education and Studies in the Education of Adults</i>	Field, Lovell, & Weller (1991)
1989-93	110 Adult Education Theses from St. Francis Xavier University	Gillen (1994)
1990-94	269 CASAE Conference Papers	Robinson (1996)

Boshier and Pickard listed 13 authors and 11 publications cited most often in *AE* from 1968 to 1977. Twelve years later, in a study by Field, Lovell, and Weller (1991), Boshier and Pickard's (1979) research methodology was replicated in an effort to determine the most frequently cited authors and publications in two prominent British journals of adult and continuing education: the *International Journal of Lifelong Education and Studies in the Education of Adults*. In 1993, Gillen extended Boshier and Pickard's (1979) study by identifying the most frequently cited authors and publications in Volumes 28 to 38 of *AE/AEQ*.<sup>1</sup>

In 1994, Gillen took the study of citation practices in a new direction with a study of 110 masters theses at St. Francis Xavier University. Unlike previous studies, Gillen's 1994 study examined the citation practices of a group that was predominantly Canadian, and by studying the work of graduate students, Gillen greatly reduced the likelihood of extensive self-citations being reflected in the data.

<sup>1</sup> Commencing with Volume 34, 1983, the name of the journal was changed from *Adult Education* to *Adult Education Quarterly*.

## What Can Be Learned from Citation Analysis?

Prior to discussing the purpose and methodology of this study, some observations and cautionary notes are in order. One of the major questions that drives a study such as this is: What exactly does it mean when one author cites another? According to MacRoberts and MacRoberts (1989) there are many reasons for citing a work, some positive and some negative.

On the positive front, "one purpose of giving references is to provide justification for the positions adopted in a paper. Another purpose is to demonstrate the novelty of one's results" (Gilbert, 1977, p. 116). Bavelas, however, notes two extremes: the "true scholarly impact at one end (e.g., significant use of the author's theory, paradigm, or method) and less than noble purposes at the other (e.g., citing the journal editor's work or plugging a friend's publications)" (1978, p. 160). The boosting of friends' citation counts and the potential for using certain citations to influence likely journal reviewers are two concerns also noted by Furnham (1990).

Sachs speaks to the problem of trying to determine the motivating factors that cause one person to cite another claiming that "it cannot be determined from the citation alone whether a particular reference is being used to support a particular line of work or whether the work is attempting to refute the cited reference" (1984, p. 8). In order to address this issue one would have to examine the context of every citation within a text and then develop various categories in which the citations could be placed.

One variable that affects the accuracy of citation counting is what Smith calls "implicit citations" (1981, p. 93). In adult education, for example, a citation to Knowles (1980) is likely implied every time the term andragogy is used. Shortly after Knowles popularized the use of the term, it would have been inappropriate not to acknowledge Knowles book, *The Modern Practice of Adult Education*. Today, however, the term andragogy is so widely known in the field of adult education that a *formal* citation to Knowles would not only seem peculiar, but perhaps even condescending to an informed reader. As Smith notes, "once an idea is sufficiently known, citing the original version is unnecessary" (1981, p. 93). The problem in citation analysis, then, is that implicit citations do not factor into the results.

Despite these and other variables, Cole and Cole claim that citations provide a "roughly valid indicator of influence" (1972, p. 369). Peritz notes that "the number of times a paper is cited may be used as a rough-and-ready indicator of its merit" (1992, p. 448). So concludes "that citation analysis is a useful method if it is employed carefully" (1988, p. 237).

## Study Purposes

The purposes of this study are to:

1. Identify the 20 most frequently cited authors and the 10 most frequently cited publications in the papers of the 1990-1994 CASAE conferences.
2. Examine the difference and significance between counting "references" and "internal citations."
3. Critique four frequently used procedures for counting references and assess their strengths, weaknesses, and potential for use in future studies.
4. Examine the implications of including self-citations in the tabled results, and the importance of attributing appropriate credit to participants in collaborative (multiple-author) works.
5. Examine and discuss any themes and trends from the findings which might distinguish a Canadian context in adult education research.

## Research Methodology

As selecting and justifying the most appropriate citation counting procedure is essential in a study of this nature, a detailed discussion of the methodology follows.

### Data Source

The 310 papers presented at the 1990 to 1994 CASAE conferences comprise the study's data source. The CASAE papers were selected to ensure a data source with a strong Canadian context:

1. The CASAE papers provided a unique opportunity to examine a large number of articles (269)<sup>2</sup> written by Canadian adult education researchers and practitioners, including a small number of graduate students.
2. It was assumed that the conference papers would provide a data source that was representative of the gender ratio of adult education researchers in Canada.

<sup>2</sup> Fourteen papers that did not have (or did not require) a reference section were eliminated from the study. Based solely on an effort to examine the authors and publications influencing Canadians, the 27 papers identifiably written by foreign authors were also eliminated from the study. It is expected that some papers in which the author has identified him or herself to be associated with a Canadian university will in fact have been written by a foreign graduate student or a foreign visiting professor. Considering the volume of papers in the data source, this variable is not expected to be significant.

3. The east-west alternation of the five CASAE conferences (Victoria, 1990; Kingston, 1991; Saskatoon, 1992; Ottawa, 1993; and Vancouver, 1994) provided a reasonably fair opportunity for adult education researchers from across the country to participate and present at the conferences. Accordingly, the risk of undesirable variables such as frequent citation of dominant regional authors would not be a major concern.
4. The CASAE conferences provided a medium for the presentation of papers from "grass roots" Canadian researchers or practitioners who may not have the time or resources to prepare scholarly journal articles, or persons whose presentation topic may not be considered well suited for publication in a mainstream adult education journal.

### Procedures for Counting Citations: Three Areas of Concern

In Boshier and Pickard's 1979 study, a system presented by Arlin (1978) known as the Full-Publication Equivalent (FPE) was used. According to Arlin (1978) the counting method awards one FPE for each single-author citation, 0.5 of an FPE for each author of a co-written work, and 0.5 of an FPE for the first listed author in a work with three or more authors. Under this FPE system, credit is *only* given to the first author in a work with three or more authors; the remaining authors are not identified and therefore receive no credit as contributors to the adult education literature.

However, Boshier and Pickard (1979), made a significant modification to Arlin's method by giving recognition and partial credit to *all* authors of a cited work, thus providing representation for those individuals involved in collaborative research and publishing. Rather than giving 0.5 of an FPE to just the first listed author in a work with more than two authors, Boshier and Pickard (1979) allotted 0.5 FPE to *every* author. This change was particularly important in light of the fact that Field, Lovell, and Weller (1991), and Gillen (1993) attributed their respective method for counting citations to Boshier and Pickard's (1979) FPE system.

Despite the utility of the FPE system, Boshier and Pickard (1979) made one debatable decision in their study: they elected to include self-citations in the data and the tabled results. As with the FPE modification, Field, Lovell, and Weller (1991), and Gillen (1993) also replicated this aspect of Boshier and Pickard's (1979) methodology.

To determine the most appropriate methodology for this study, three particular aspects of citation analysis were examined:

1. The significance of including self-citations in the results.
2. The allocation of credit for multiple-authored works.
3. The ranking of authors and publications.

The problem with self-citations. There has been much discussion on the significance of self-citation in citation analysis research (Arlin, 1978; Budd, 1990; MacRoberts & MacRoberts, 1989; Porter, 1977; Smith, 1981). This article will not attempt to address the many arguments for and against the practice of an author citing his or her previous work, as the *reasons* for citing one's own work, no matter how valid, are not relevant to the context of this study.

An excellent case for the exclusion of self-citations can be drawn from Field, Lovell, and Weller's (1991) study, in which two highly ranked authors gained *all* of their citations through self-citation. Also, in Boshier and Pickard's (1979) study, the author who placed first on the only tabled list of authors would have lost over 70% of his citations if self-citations had been removed, an outcome noted by Boshier and Pickard in their detailed discussion on the impact of self-citations.

The question to be asked in a study such as this relates to influence and impact: does self-citation demonstrate, in any possible way, that some other person has been influenced by the work that has been self-cited? The answer to this question is an unequivocal "no." Arlin (1978), the originator of the FPE method, noted that "self-citations were not felt to be indicative of an author's impact in the field" (p. 9). Accordingly, if the objective of a citation analysis is to ascertain the impact of an author's work on others, then including self-citations may be distortive and misleading. As such, this study excludes self-citations from the tabled results.

The critique on eliminating self-citations from this study should not be perceived as an attack on those who cite their previous work when the topic and context of their work warrants such an inclusion. Self-citation can be an indicator of a willingness to expand or build upon one's previous work. As Boshier and Pickard note, "the absence of scholars willing to approach research in a cumulative fashion could weaken the field" (1979, p. 42). The problem, then, is not with the *practice* of self-citation; rather, the problem lies in including self-citations in studies where the objective is to measure the impact or influence on others.

Multiple-authorship: Allocating appropriate credit. A review of citation counting methods used in other fields revealed three distinct and widely recognized methods: complete, straight, and adjusted counting<sup>3</sup> (Harsanyi, 1993; Lindsey, 1980; MacRoberts & MacRoberts, 1989). These three methods, along with the FPE method that was used in the four previously mentioned adult education citation studies were evaluated in an effort to select the most reliable counting method for this study. Table 2 summarizes the differences in the four established methods for counting citations.

<sup>3</sup> Complete counts are sometimes referred to as normal counts.

Table 2

Established Methods for Counting Citations

Method	Points per reference for a work with:			
	1 author	2 authors	3 authors	4 authors
FPE*	1	0.5 each	0.5 each*	0.5 each*
Complete (Normal) Counts	1	1 each	1 each	1 each
Straight Counts	1	1 for 1 <sup>st</sup> listed author only	1 for 1 <sup>st</sup> listed author only	1 for 1 <sup>st</sup> listed author only
Adjusted Counts	1	0.5 each	0.33 each	0.25 each

\* The FPE citation counting method developed by Arlin (1978) was modified by Boshier and Pickard (1979) to provide 0.5 citations for each author in a work with more than two authors.

When using complete counts, all authors are given full credit for each citation (Harsanyi, 1993). For example, with this method one reference to *Women's Ways of Knowing* (1986) would result in one full citation point being granted to each of the four co-authors Belenky, Clinchy, Goldberger, and Tarule. However, when using straight counts (MacRoberts & MacRoberts, 1989), the same example would provide one full citation point for Belenky, and **zero** for Clinchy, Goldberger, or Tarule. The underlying assumption of this method is that the first listed author is the lead contributor. This assumption does not appear to hold true for *Women's Ways of Knowing* (1986), as the odds that alphabetical ordering in a work with four authors could coincidentally reflect each author's respective level of contribution to the work are 1 in 24 ( $4 \times 3 \times 2 \times 1 = 24$ ). Also, of the 543 co-authored works in this study's data source of 269 papers, 352 (65%) were ordered alphabetically. It seems obvious, then, that all collaborators are not determining the name-ordering sequence on the basis of their respective level of contribution to the work.

Lindsey (1980) is very critical of the straight count method on the grounds that straight counts are most often used as a matter of convenience to save time or money during the data collection process.

Adjusted counts provide proportional credit for each author in a multiple-author work (MacRoberts & MacRoberts, 1989). A reference with two authors would result in 0.5 citations each; a reference with three authors, 0.33 citations each; a reference with four authors, 0.25 citations each, etc. So, in the previous example, Belenky,

Clinchy, Goldberger, and Tarule would receive 0.25 citations each per reference. The FPE method (as modified by Boshier and Pickard in 1979) is similar to the adjusted counting method, except that the FPE method provides 0.5 citations for every author in a multi-authored publication, regardless of the number of contributors.

Regarding multiple-authorship, Narin indicates that "there does not seem to be any reasonable way to deal with the attribution problem, except to attribute a fraction of a publication to each of the authors" (1976, p. 125). Narin's position is echoed by Lindsey (1980). Interestingly, when Arlin (1979) introduced the FPE method for counting an author's contribution to a journal article, he noted that the ideal situation would be to provide 0.33 of a citation for each author in a work with three authors. Arlin likely would have preferred that his data source permitted easy access to the "and others" (1978, p. 7) authors.

In light of the arguments presented, and in consideration of other arguments for (Lindsey, 1982) and against (Long & McGinnis, 1982a, 1982b) the need to use adjusted counts, the decision was made that for the purposes of this study the adjusted count method was most appropriate (see Table 3).<sup>4</sup>

Ranking authors and publications. In previous adult education citation studies, the method used for ranking an author was based on the number of times his or her work had been noted in the reference pages of the data source. Accordingly, this study ranks authors in the traditional manner—by number of total references (see Table 3). One of the objectives of this study, however, is to examine the results using an additional method for presenting data on author impact.

The supplementary method of counting involves ranking the authors according to the total number of "internal citations" in the conference papers of this study. Though the terms "citation" and "reference" have been used interchangeably throughout this study, other studies, and most literature on citation analysis, almost without exception researchers use both terms to identify the number of "references" in a paper, and not the total number of "internal citations" to each reference in any given article.

In order to distinguish between the two, the terms *reference* or *citation* will be used to denote a bibliographical reference entry to a written work, and the phrase *internal citation(s)* will be used to refer to how many times *within the text* of a paper that a particular *reference* was formally cited. Because an article or paper often contains several internal citations for a given bibliographical reference, counting references and counting internal citations can lead to considerably different results. Though counting, recording, and collating the number of internal citations for each reference is a much more time consuming task than counting references, it is hoped that some insight will be gained when the two sets of data are

<sup>4</sup> However, for comparative purposes, a rank ordered table is also provided which depicts the rankings of authors using all four methods previously described (see page 78, Table 6).

tabled. For comparative purposes, Table 3 contains the number of internal citations for each ranked author.

Table 3\*

Most Frequently Cited Authors in the Papers of the 1990-1994 CASAE Conference Proceedings (Rank Ordered by Number of Adjusted References)

Rank	Author	Number of References (Adjusted)	Number of Internal Citations (Adjusted)	Number (Percentage) of the 269 Papers Cited In
(1)	Freire, P.	33.0	48.0	28 (9.6%)
(2)	Mezirow, J.	26.0	40.0	22 (8.2%)
(3)	Welton, M.	22.0	30.0	20 (7.4%)
(4)	Cross, K.P.	19.0	35.0	19 (7.1%)
(5)	Knowles, M.S.	17.0	27.0	16 (5.9%)
(6)	Brookfield, S.	14.0	19.0	12 (4.5%)
(7)	Selman, G.	14.0	18.5	11 (4.1%)
(8)	Tough, A.M.	14.0	15.0	13 (4.8%)
(9)	Hart, M.U.	13.0	21.0	10 (3.7%)
(10)	Kolb, D.	13.0	20.0	11 (4.1%)
(11)	Cervero, R.M.	13.0	13.0	12 (4.5%)
(12)	Merriam, S.B.	11.5	12.5	17 (6.3%)
(13)	Collins, M.	11.0	11.0	8 (3.0%)
(14)	Houle, C.O.	10.0	12.0	9 (3.3%)
(15)	Rockhill, K.	9.0	12.0	8 (3.0%)
(16)	Giroux, H.A.	8.5	15.0	8 (3.0%)
(17)	Apps, J.W.	8.5	12.0	8 (3.0%)
(18)	Gilligan, C.	7.5	12.5	8 (3.0%)
(19)	Clinchy, B.M.	5.0	13.0	14 (5.2%)
(20)	Darkenwald, G.G.	4.5	7.5	9 (3.3%)
(21)	Glaser, B.	4.5	4.5	10 (3.7%)
(22)	Strauss, A.L.	4.5	4.5	9 (3.3%)
(23)	Tarule, J.M.	4.0	12.0	15 (5.6%)
(24)	Belenky, M.F.	3.5	10.0	14 (5.2%)
(25)	Goldberger, N.R.	3.5	10.0	14 (5.2%)

\* Self-citations not included.

\*\* The category of "number" and "percentage of papers cited in" has been provided as an additional means of putting "impact" into perspective. Freire, for example was cited in almost 10% of the papers. There are two reasons that examining the number of references alone cannot provide information of the percentage of papers cited in. First, authors—especially prominent ones (e.g., Freire, Mezirow, etc.)—often have two or more separate works cited in the same paper. Second, authors who publish in collaboration with others have a reduced adjusted reference count. Merriam's reference count of 11.5, for example, fails to indicate that she was cited in 17 separate papers.

## Findings, Data Collection, and Analysis

In totaling the citations, some irregularities had to be addressed. For example, in one article, publications by Knowles and Cross were internally cited using the American Psychological Association format, yet neither author had an entry in the paper's reference section. Silverman refers to this phenomenon as the "embedded citation" (1985, p. 155), and he indicates that it is just one of the ways that errors can occur in citation counting.<sup>5</sup> Unfortunately, embedded citations were not included in the final tally of this study because full reference information was not available. In other articles, complete references were provided, yet no internal citations or references to the entries could be found. In this case, one reference was awarded for each entry in the reference section. These factors and others place a minor margin of error in the tabled results.

In order to ensure that impact was fairly assessed, evidence of citation from others in at least eight papers was required. Lindeman's 14 references, for example, did not qualify him for listing because all 14 references could be accounted for in only three papers. The minimum figure of eight papers was chosen somewhat arbitrarily because it allowed for a ranking of the top 25 authors, whereas a criteria of seven papers would have provided a list of the top 18. With regard to the most frequently cited publications, presented in Table 4, a minimum of six references per publication provided a list of the top 12 publications.

## Discussion

### Comparison with Other Adult Education Citation Studies

Even though self-citations were not included in the results, and despite the fact that a slightly different citation counting method was used, comparisons with the findings in previous studies indicate several similarities. The results of this and the three most recent adult education citation studies (Field, Lovell, & Weller, 1991; Gillen, 1993, 1994) confirm the international impact that certain authors have on the field of adult education. Freire, Mezirow, Knowles, Cross, Brookfield, Tough, and Houle are present in the lists of all four studies.

Six of the eight most frequently cited authors from Gillen's (1994) study appear in the top eight of this study. Where Gillen's (1993) top eight include Knox and Houle, they were replaced in this study's top eight by Selman and Welton. With regard to the most frequently published works, Gillen's 1993 and 1994 results contain five books that are also common to this study.

Considering that the beginning data collection period of Gillen's 1993 research was 1978, and that the end of this study's data period was 1994, it could be argued

<sup>5</sup> One editor of conference proceedings informed me that embedded citations occasionally occur when better known bibliographical references are deleted from author's papers in order to have the length of the paper fit the page layout and length required by the editors of the proceedings.

that the following five books have had the most impact on American and Canadian adult education researchers in the last two decades: Knowles' *The Modern Practice of Adult Education* (1970); Freire's *Pedagogy of the Oppressed* (1970); Cross' *Adults as Learners* (1981); Houle's *Continuing Learning in the Professions* (1980); and Tough's *The Adult's Learning Projects* (1971).

### **The Canadian Influence**

Two particular findings in Tables 3 and 4 imply that the data source of this study has affected the results: first, the prominence of Canadian researchers in the list of most frequently cited authors; and second, the significant number of female authors contributing to the 1990 to 1994 CASAE conferences.

An examination of the Canadian authors<sup>6</sup> revealed a total of five appear in the top 15 of the list of most frequently cited authors. Of Welton (2<sup>nd</sup>), Selman (7<sup>th</sup>), Tough (8<sup>th</sup>), Collins (13<sup>th</sup>), and Rockhill (15<sup>th</sup>), Tough is the only Canadian ranked in previous studies (Field, Lovell, & Weller, 1991; Gillen, 1993, 1994).

Welton's prominent position in Table 3 is not surprising. A review of Welton's work indicates that his journal publication patterns are diverse, with a number of recently published articles in Canadian, American, and British based adult education journals. Welton was also frequently cited for his personal contributions in a book that he edited, *Knowledge for the People* (1987). The fact that Welton has not placed in previous citation studies could be due to the international dispersion of his published work. While Welton's position in the rankings of this study is solely reflective of the use being made of his work by other Canadians, it is reasonable to suggest that he would also fare well in a study using multinational adult education journals as a data source.

Tough's high ranking is fairly easy to analyze, as almost all of his references are to his enduring work, *The Adult's Learning Projects* (1971/1979). Tough's book was the only work written by a Canadian to make the list of most referenced publications. Tough's ranking in this and other studies indicates that his 1971 work has had, and continues to have, value as a resource for adult education researchers.

Selman's high ranking can be attributed to the referencing by others of a variety of his works, many related to discussion of the social responsibilities of the adult educator. Selman's most frequently cited work (5 times), though, was a text co-authored with Dampier, *The Foundations of Adult Education in Canada* (1991). This book is understandably of particular interest to Canadians.

Rockhill's contributions are eclectic, with no one single publication being referenced frequently enough to distinguish a specific thematic contribution to the field. Rockhill's cited works include literature on women's issues, continuing

<sup>6</sup> The question of Canadian citizenship is not addressed here. The fact that all five persons noted have been associated with their respective Canadian universities for a period of ten or more years is taken to denote a Canadian perspective.

education, perspectives on international adult education, and factors related to participation in education.

Collins' placement can be accounted for by citations to various journal articles, and five citations to his fairly recent book, *Adult Education as a Vocation* (1991). It is likely that the only reason Selman's (1991) book (co-authored with Dampier) and Collins' book did not make the list in Table 4 was because both works were published in 1991, thus neither book received any citations in the CASAE conference papers of 1990 or 1991.

As mentioned previously, another noteworthy finding in this study is evidence of the significant impact and influence by female authors on presenters at the 1990 to 1994 CASAE conferences. The list of most frequently cited authors in Table 3 includes nine women. Even though Belenky, Clinchy, Goldberger, and Tarule all have low adjusted reference counts, at 0.25 citations per reference, their positions in the top 25 are well deserved. Of the nine women listed—Cross, Hart, Merriam, Rockhill, Gilligan, Clinchy, Tarule, Belenky, and Goldberger—only Cross has placed in previous citation studies (Field, Lovell, & Weller, 1991; Gillen, 1993, 1994).

Interestingly, in her later study, Gillen noted "evidence that women writers like Gilligan and Belenky et al. are gaining in importance" suggesting that "their impact can be investigated in future studies" (1994, p. 182). In this study, not only does Gilligan's *In a Different Voice* (1982) and Belenky, Clinchy, Goldberger, and Tarule's *Women's Ways of Knowing* (1986) fare prominently, so too do Hart's *Working and Education for Life* (1991) and Cross' *Adults as Learners* (1981).

In considering the prominent placing of several Canadian adult education professors in this study, it is important to acknowledge the findings in Blunt and Lee's study on graduate student contributions to *Adult Education Quarterly*, "that certain faculty members actively support graduate student publishing and serve as mentors" (1994, p. 139). Thus the high placing of at least some Canadian professors could be in part due to their influence on current and past graduate students who are now themselves actively contributing to the body of adult education research in Canada.

### **The Canadian Context: Beyond the Numbers**

The discussion so far has concentrated on the authors, their works, and the significance that the Canadian data source has had in their placement. The larger issue, however, is a more holistic one: What underlying themes can be revealed about adult education research in Canada by looking beyond the number of citations?

An examination of the abstracts and the references of the papers of the 1990 to 1994 CASAE conferences reveals a cluster of interrelated issues and interrelated authors. A look at the most frequently cited authors, including those authors who narrowly missed making the list—Habermas, Foucault, Gramsci, Cunningham,

Weiler, and Lather—revealed connections between the authors and the themes of many of the papers presented at the 1990 to 1994 CASAE conferences.

For example, there were numerous papers on feminist issues. These papers were frequently supported with references to the work of Belenky, Clinchy, Goldberger, Tarule, Gilligan, Hart, Lather, Weiler, and others. Papers on self-directed learning issues were also common, with supporting references to Houle, Knowles, Tough, and Brookfield. Brookfield was frequently cited with Mezirow and Freire, or both, in several papers related to critical thinking, critical reflection, or critical consciousness. Transformational learning was also a popular presentation theme, resulting in many supporting references to Mezirow. Papers on research methodology emphasized the qualitative approaches of Glaser and Strauss (grounded theory) and Merriam (case study methods).

Interest in the traditional roles and programs of the Canadian adult educator (community development, rural and agricultural education, workplace education, literacy, social and cultural awareness, social change responsibilities, etc.) fared prominently in many papers, with several supporting references to Selman and Welton. Radical adult education issues such as emancipatory education, radical social activism, social transformation, critical pedagogy, critical literacy, critical discourse, conscientization, or radical critical theory, accounted for many of the references to Freire, Foucault, Gramsci, Habermas, Giroux, Collins, Hart, and Cunningham.

To borrow from Selman's terminology, it appears that themes more closely associated with the adult educator as a "change agent" were dominant over themes related to the adult educator as a "program technician" in the 1990 to 1994 CASAE conferences (1985, p. 75). Whether these themes transcend the research paradigm and emerge in daily practice in Canada is a question for another study.

### **Collaboration: Canadian Women and Adult Education Research**

One theme that emerged which prompted further inquiry was the impact that Canadian women are having on research in adult education in Canada. While conducting the study, two things seemed apparent. First, Canadian women presented the majority of papers at the 1990 to 1994 CASAE conferences. Second, Canadian female authors are more likely to work collaboratively than are males.

Women were involved, either singly or collaboratively, in the presentation of 52% of the 1990-1994 CASAE conference papers, while men were involved in the presentation of 33% of the papers, and women and men working collaboratively presented 15% of the papers. Women collaborated with other women almost three times as often as men collaborated with other men. Women also collaborated with women in groups of three or more on 14 occasions, while men had only three such co-authored collaborations (see Table 5).

Table 5

Breakdown by Gender and Collaboration of Papers Presented at the 1990-1994 CASAE Conferences

Of 277 Papers	Author(s)	Gender
106 (38.3%)	Single-author	Female
79 (28.5%)	Single-author	Male
41 (14.8%)	Multi-author	Female(s) & Male(s)
38 (13.7%)	Multi-author	Females (2 or more)
13 (4.7%)	Multi-author	Males (2 or more)

The extent of collaborative work by female authors holds implications for citation research and the choice of counting methods. When straight counts are used, then Clinchy, Strauss, Goldberger, Tarule, and Merriam are all unduly penalized. This issue should be of concern to researchers in all disciplines where inappropriate counting measures might result in inaccurate assessments of productivity. In the natural sciences for example, Long, McGinnis, and Allison (1980) report that 83% of chemistry papers, 70% of biology papers, and 67% of physics papers are multiauthored.

At least one Canadian university uses publication counts as part of the internal staff assessment procedure (Furnham, 1990). While according to Field, Lovell, and Weller "some American universities use [citation counting] to determine lecturer and researcher productivity when reaching decisions on tenure, promotions, and salary merit raises" (Field, Lovell, and Weller, 1991, p. 5).

Harsanyi (1993) states that "a lack of careful consideration in deciding on the most appropriate (rather than expedient) methodology for crediting multiple-authored publications can introduce a serious source of bias in research on scholarly publishing" (pp. 325-326). Evidence of the potential for such bias is observable in Table 6 which illustrates how dramatically the method used for counting can affect the rankings of authors who choose to work in collaboration with others.

Table 6\*

Most Frequently Cited Authors in the Papers of the CASAE Conference Proceedings  
1990-1994 (A Comparative Table of Citation Counting Methods)

Rank	Author	Adjusted Count	Complete Count	Straight Count	FPE** Count
(1)	Freire, P.	33.0	37	29	33.0
(2)	Mezirow, J.	26.0	26	26	26.0
(3)	Welton, M.	22.0	23	21	22.0
(4)	Cross, K.P.	19.0	19	19	19.0
(5)	Knowles, M.S.	17.0	17	17	17.0
(6)	Brookfield, S.	14.0	14	14	14.0
(7)	Selman, G.	14.0	17	17	14.0
(8)	Tough, A.M.	14.0	14	14	14.0
(9)	Hart, M.U.	13.0	13	13	13.0
(10)	Kolb, D.	13.0	13	13	13.0
(11)	Cervero, R.M.	13.0	14	14	13.0
(12)	Merriam, S.B.	11.5	17	8	11.5
(13)	Collins, M.	11.0	11	11	11.0
(14)	Houle, C.O.	10.0	10	10	10.0
(15)	Rockhill, K.	9.0	9	9	9.0
(16)	Giroux, H.A.	8.5	10	7	8.5
(17)	Apps, J.W.	8.5	9	8	8.5
(18)	Gilligan, C.	7.5	8	8	7.5
(19)	Clinchy, B.M.	5.0	16	2	8.5
(20)	Darkenwald, G.G.	4.5	9	8	4.5
(21)	Glaser, B.	4.5	10	8	4.5
(22)	Strauss, A.L.	4.5	9	1	4.5
(23)	Tarule, J.M.	4.0	15	0	7.5
(24)	Belenky, M.F.	3.5	14	14	7.0
(25)	Goldberger, N.R.	3.5	14	0	7.0

\* Self-citations not included.

\*\* The FPE citation counting method was developed by Arlin (1978, p. 7) and modified by Boshier and Pickard (1979, p. 37) to provide .5 citations for each author in a work with more than two authors.

### To What Extent Did Canadian Women Influence the Results?

It is tempting to attribute the prominent role of women in the results of this study to the seemingly disproportionate number of women presenting papers at the 1990-1994 CASAE conferences. There are, however, at least two reasons to discount such

a premise. First, because of the large volume of papers presented at the 1990 to 1994 CASAE conferences, the number of female presenters should be representative—not disproportionate—of the gender ratio of adult education researchers in Canada. Second, an examination of the gender of persons citing the top nine women in the findings revealed that 63% of the references were made by women, and 37% were made by men. If references to *Women's Ways of Knowing* (1986)—a book that is primarily of concern to women—are removed from the data, then women are responsible for only 57% of the citations to Cross, Hart, Merriam, Rockhill, and Gilligan.

These findings suggest that even if there were a 50-50 gender ratio of presenters at the CASAE conferences, most of the women who were highly ranked would still have been well represented in the list of most frequently cited authors. These findings also imply that the gender ratio of the adult education authors with the most impact on Canadian authors is slowly approaching the gender ratio of Canadian researchers in adult education. Thus, one significant finding from this study related to the Canadian context is a slow but apparent leveling of the gendered playing field, a field that has been dominated by men in the previous citation studies of American or British-based publications.

### Recommendations for Future Research

An important topic for further inquiry emerging from this study is that of collaboration, especially collaborative research and publishing trends with relation to gender. Rachal and Sargent (1995), in a study of publication productivity in adult education journals, suggest that collaboration patterns should be an area of future research. Also, Harsanyi notes that while there has been an increase in collaborative research in a number of disciplines, "few researchers have addressed collaborative authorship" (1993, p. 325).

Methodological concerns have been outlined throughout this article. A strong case has been made for eliminating self-citations from the tabled results in future studies. Also, a comparative analysis of counting procedures indicated that adjusted counting, "though time consuming, is the most equitable, reliable, and thorough way of counting citations, especially with regard to multiple-authored works with three or more contributors. Future studies may wish to further explore the potential for using "internal citations" and "the number of papers cited in" as means of measuring impact and influence.

Another area of interest for future study is the relationship between gender and research publication. In this study 57% of all single-authored papers were presented by women (100 of 185). Similarly, in a study of graduate student contributions to *AEQ*, Blunt and Lee (1994) found that of the persons who presented their research at conferences prior to *AEQ* publication 57.5% were women. Despite the differences in data sources (journal articles versus conference

papers) and despite the differences in the target groups (predominantly American adult education graduate students versus Canadian adult education researchers), the preference of women to disseminate their research findings through conference presentations is worthy of further investigation.

The study shows that critical and traditional issues are often the focus of attention for Canadian adult education researchers. Is this focus on adult education as a "movement" typical of adult education research on a North American or global level, or does this trend distinguish a uniquely Canadian context? Perhaps a content analysis comparing the themes of papers presented at CASAE conferences with papers presented at Adult Education Research Conferences (AERC) or other international conferences would provide data that could answer this question.

### **Conclusion**

In light of the findings, it seems evident that citation analysis of adult education literature is capable of identifying the most influential authors in a field; the leaders emerged regardless of the country providing the data source (Canada, United States, Britain), and regardless of the type of data source used (journal articles, theses, conference papers). It is also interesting that while the placement of Canadians and the significant impact of women are unique to this study, the core group of prominent international authors was not displaced.

In closing, some cautionary comments are warranted. Gillen noted that "citation rates are a single measure of quality, a complex concept, and should be viewed with caution" (1993, p. 176). On this point I concur. To base any author's contribution to the body of adult education research solely on the number or frequency of citations in one particular site of research dissemination would do a disservice to the many researchers who concentrate on specific or isolated areas in adult education.

Those persons who singularly focus on specific issues, themes, contexts, etc., are only occasionally seen through citation studies to be making a large contribution to the field of adult education; most (not all) of the highly ranked authors and books have a general or generic appeal, an appeal that transcends the many diverse content areas associated with adult education.

Though this study, to some extent, has reinforced the dominant status of some authors and publications in the field, it has also exposed an interesting trend with a Canadian context. The high level of interest in feminist issues, emancipatory education, radical social activism, social transformation, critical pedagogy, critical discourse, conscientization, radical critical theory, and social transformation, and the high ranking of authors who study one or more of these themes, demonstrates a level of interest in radical adult education that has not been revealed in the citation analyses of other data sources.

Also, the considerable interest placed on worker or workplace education, community development, social and cultural awareness, agricultural education, literacy, etc., implies that Canadian adult education researchers are, in general, interested in restoring-or at least examining-the historically traditional role of adult education, "a field the purpose of which, essentially, was to improve society" (Selman, 1985, p. 79).

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