

Accounting Historians Journal

Volume 38
Issue 1 June 2011

Article 4

2011

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Recommended Citation

Badua, Frank A.; Previts, Gary John; and Vasarhelyi, Miklos A. (2011) "Tracing the development of accounting thought by analyzing content, communication, and quality of accounting research over time," *Accounting Historians Journal*: Vol. 38 : Iss. 1 , Article 4.
Available at: https://egrove.olemiss.edu/aah_journal/vol38/iss1/4

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Accounting Historians Journal
Volume 38, Number 1
June 2011
pp. 31-56

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TRACING THE DEVELOPMENT OF ACCOUNTING THOUGHT BY ANALYZING CONTENT, COMMUNICATION, AND QUALITY IN ACCOUNTING RESEARCH OVER TIME

Abstract: This paper analyzes the longitudinal development of accounting thought by characterizing the content of accounting research over several decades (1963 to 2003). The paper also investigates the interaction among accounting scholars and examines the relationship of research quality, topical coverage, methodological tools, and citation behavior. Thus, this analysis describes how accounting research has evolved, both in its content and in the way it has been used and perceived by its adherent scholars.

INTRODUCTION

The motivation for this study is to improve our understanding of the relationships exhibited in academic research over a period of several recent decades. This paper represents a study of accounting research as embodied in three scholarly accounting journals (*Contemporary Accounting Research*, *Journal of Accounting Research*, and *The Accounting Review*) as related to the objective of improving our understanding of this literature by employing a set of taxonomic properties in our analysis about the content and context of said literature. Further, this study characterizes the content of accounting research, the communication of this research through the interaction among account-

Acknowledgments: The authors would like to thank Dr. Richard Fleischman and the reviewers for their help on this paper. The paper is dedicated to Don Quirino Badua y Espero (1928-2011) who taught his son to love history for the beauty of its stories and the wisdom of its lessons.

ing scholars, and how both this content and this interaction help define research quality. By this characterization, the paper seeks to provide a conception of how accounting research has evolved over time based on the efforts of those who produce, use, and evaluate it. The paper also seeks to improve our understanding of the topical and methodological content of accounting literature and in this way contributes to the literature of the history and development of accounting thought.

The content of accounting research is described by a taxonomic analysis of its topical and methodological characteristics. Taxonomic (Greek “taxis” + “nomia” = arrangement + method) analysis is a method of systematically classifying and arranging items according to their attributes. Therefore, the content of accounting research is defined by classifying the artifacts of the research; that is, papers published in scholarly journals according to what topics these papers cover and what methods their authors used to gather data and arrive at conclusions.

The interaction among accounting researchers is characterized by citation analysis. Citation analysis identifies which research papers have been referenced in other research papers, and thereby endeavors to trace the development of ideas, to chart the interdependencies between groups of researchers, and to evaluate the influence of particular research papers, organs, or paradigms.

Finally, this paper explores the possibility of a new measure of research quality based on the content of research over several years and the citation patterns that have developed over time. This measure would be comprised of a component measuring the diversity of the research content and a component measuring the degree of integration of that research. As discussed later, both these characteristics may be correlated with research quality.

Taxonomic Analysis Defined and Exemplified: The philosopher Thomas Kuhn [1962, pp.16-17] proposed the idea that all research is characterized by “intertwined theory and methodological belief.” Therefore, one way in which research may be defined and described is by identifying its topical foci and methodological techniques. Consequently, taxonomic analysis, which classifies artifacts according to their salient characteristics, will be used to profile the content of accounting research by identifying its topical and methodological attributes.

Several accounting history research papers have taken the form of taxonomic studies of literature by analyzing papers ac-

ording to certain topical or methodological attributes. These include Haseman [1978] who concentrated on management accounting literature; Vasarhelyi *et al.* [1988] who studied papers published in *Contemporary Accounting Research*; Parker [1988], Carnegie and Potter [2000], and Fleischman and Radcliffe [2005] who focused on accounting history studies; Previts and Brown [1993] who categorized papers published in the *Journal of Accountancy*; Fleming *et al.* [1990, 1991, 2000] and Rodgers and Williams [1996] who chronicled research in *The Accounting Review*; and Gamble *et al.* [1995] who studied the accounting education literature.

Citation Analysis Defined: Biochemist Eugene Garfield [1964, 1975, 1994] pioneered citation analysis, asserting that there exists a “conceptual association of scientific ideas as recognized by...research authors” and that “by the references they cite in their research papers, authors make explicit linkages between their current research and prior work in the archive of scientific literature” [Garfield, 1994]. Thus, citation analysis can be used to describe a research network by contextualizing its constituent parts and finding out how different papers or journals interact and inform one another.

However, citation analysis can also be used not merely to describe research but to evaluate it. Examples of accounting research papers taking the form of citation analyses are McRae [1974], Dyckman and Zeff [1984], and Bricker [1988]. Examples of non-accounting citation studies include Bush *et al.* [1974], Hamelman and Mazze [1974], Eagly [1975], Ederington [1979], Liebowitz and Palmer [1984], Alexander and Mabry [1994], Borokovich *et al.* [1995], and Borokhovich *et al.* [1999] who used citation analysis to determine which journals or papers dominate others. In these papers, the extent of this hegemony is commonly measured by a metric derived from the frequency that a journal or paper is cited in other research. Articles that are cited more frequently are assumed to have a greater impact on the literature.

Hence, citation analysis can be used in two ways. First, it may be used as an evaluative metric to determine the influence a journal or paper has on researchers. Second, citation analysis can be used to describe the degree of integration of research outlets which, as discussed later, is a desirable characteristic.

Uses of the Gini Metric: Econometrist Corrado Gini pioneered a statistical measure of diversity in a series of papers in the early

20th century [Stigler, 1994]. This measure, eventually named the Gini metric, captures the extent to which a population is evenly or unevenly distributed among sub-categories within the population. In the past, the Gini metric has been used to see how diversely a nation's exports were dispersed among different foreign trading partners, or how evenly wealth was distributed within populations. However, in this paper, the Gini metric is employed to gauge the diversity of topics and methods in accounting research.

METHODOLOGY AND RESULTS

Overview of Data and Data Sources: Because the ultimate objective of this paper is to determine the content and context of accounting research through taxonomic and citation analysis and to employ a combination of the two to help evaluate the quality of the research, the data used will be of two types. The first comprises the taxonomic profiles of three accounting research journals, and the second summarizes the citation patterns among these journals.

The journals studied in this paper are *Contemporary Accounting Research* (CAR), *Journal of Accounting Research* (JAR), and *The Accounting Review* (TAR). These particular research organs were selected because they purport to be interested in accounting research in general, as borne out by their self-professed research interests and by their empirically determined taxonomic profiles [Badua, 2005].

One way of quickly determining the topical focus of a journal is by reading its editorial statements [Brown *et al.*, 1987]. A review of the editorial policies of 11 different accounting research journals in the Rutgers Accounting Research Database (ARD), in which information is compiled regarding scholarly journal papers published between 1963 and the present, revealed that CAR, JAR, and TAR were self-identified as journals that would accept papers from a broad array of accounting research topics. In contrast, the eight other journals had a self-admitted focus on specific topics such as financial accounting or information systems. Thus, even though other journals such as *Journal of Accounting and Economics* or *Auditing: A Journal of Theory and Practice* may be considered dominant and influential journals because of their specific research foci, they are excluded from this study.

Hence, JAR, TAR, and CAR comprise a general purpose journal group, one that could be characterized as being more broadly based in its selection of accounting research with

papers spanning a relatively wider range of topics than the other journals. Therefore, it may be stated that the taxonomic and citation characteristics of CAR, JAR, and TAR would be representative of the accounting mainstream, and that findings as to the content and context of research published in these journal would be generally applicable.

Methods for Gathering and Analyzing Data for Taxonomic Analysis: The research attributes of interest in this paper are the topical emphases and methodological techniques that characterize accounting research as embodied by the three journals identified in the previous section. These attributes are determined by classification according to the Rutgers ARD. The most recently published hardcopy implementation of the ARD appeared in third edition in 1994 [Gardner *et al.*, 1994].

The ARD taxonomic schema is comprised of 12 different categories which collectively describe various aspects of a paper's topical foci, methodological tools, and other characteristics such as its geographic setting, probable applicability, etc. However, this paper will focus on five particular taxonomic categories which collectively describe the topical and methodological attributes of accounting research. The three topical taxons are accounting area, school of thought, and foundation discipline, and the two methodological taxons are research method and mode of reasoning.

Accounting area defines the functional realm of accounting practice to which the paper contributes. Included are financial accounting, auditing, managerial accounting, taxation, and mixed areas.

The school-of-thought taxon identifies the major area of accounting research to which the paper contributes. This taxon is unique in that the categories that comprise it are not common to those of other fields. That is, these taxonomic categories are mostly specific to accounting research. These areas include human information processing (HIPS), efficient market hypothesis (EMH), time series, mathematical programming, information economics, agency theory, institutional studies, expert systems, and accounting history.

The foundation-discipline taxon identifies which academic area provides the intellectual basis for the paper. This taxon includes psychology, sociology, political science, history, philosophy, economics and finance, engineering, communication, computer science, mathematics, decision theory, game theory, statistics, law, accounting, and management.

Taxonomic classification according to research method is intended to identify which data-gathering procedures underlie the research paper. Three broad areas of research method exist – analytical, archival, and empirical. Analytical studies may use internal logic or simulations. Archival studies use either primary records (annual reports, accounting records, and aggregated database sources, e.g., CRSP and Compustat) or secondary records (other research papers or analyses of primary data, such as forecasts). Finally, empirical studies may take the form of case studies, field studies, laboratory experiments, or surveys.

Taxonomic classification according to mode of reasoning determines which type of quantitative or qualitative analysis technique was used to formally arrive at the conclusions of the paper. These various techniques include descriptive statistics, regression, analysis of variance (ANOVA), factor analysis, non-parametric statistics, correlations, and qualitative analyses.

In order to capture the topical and methodological characteristics of accounting research, each paper of at least five pages in length from the three selected journals were manually inspected. Shorter papers, as well as editorial commentary, letters to the editors, discussions of papers, and book reviews were excluded. Each of the selected papers was read and then classified according to the various classifications comprising the five chosen taxonomic categories. In this way, the major topical and methodological attributes of accounting research as represented by the three sample journals were determined.

Once these papers had been classified, the number of papers categorized under each particular taxonomic classification was determined, and that number divided by the total number of papers published in the journal in which the paper had appeared. Counts were made and proportions computed over all years from 1963 to 2003. Hence, the proportions of papers exhibiting a particular topical or methodological characteristic were determined for all three journals in all years the journal had been in existence through 2003 (TAR papers since 1963 only were included although the journal has been published since 1926). Thus, the data run from 1963 to 2003 for JAR and TAR and 1984 to 2003 for CAR. These annual proportions are in effect a summary of the content of the entire publishing life of JAR and CAR and slightly more than half that of TAR up to 2003. Taken in aggregate, these proportions may be said to summarize the evolution of the mainstream of accounting research over the last four decades of the 20th century.

Results from Analysis of Individual Taxons: Table 1 summarizes the proportions that different research methods comprise articles in each of the three journals. The research methods reflected in CAR and JAR are predominantly primary archival studies (48.8% and 35.95% respectively) and internal logic (34.8%, 31%). TAR authors similarly utilize these two research methods except that there is a greater dependence on internal logic (38.95%) than primary archival studies (28.15%). CAR’s third most frequently deployed research method is secondary archival (7.5%), differing from JAR and TAR where laboratory studies (14.22%, 12.54%) are the third most common research method of choice.

This finding indicates that the three journals predominantly use the same data-gathering methods, except that JAR and TAR depend on laboratory studies more than CAR. This difference may indicate a behavioral focus in the former two journals that is absent in the latter.

TABLE I
Percentages of Papers Using Various Research Methods

	CAR (x/518)	JAR (x/1207)	TAR (x/1771)
research method: internal logic	34.80%	31.00%	38.95%
research method: simulation	1.55%	3.49%	2.61%
research method: archival primary	48.80%	35.95%	28.15%
research method: archival secondary	7.50%	7.83%	9.71%
research method: case studies	1.15%	1.44%	1.24%
research method: field studies	0.65%	2.66%	2.59%
research method: laboratory	2.30%	14.22%	12.54%
research method: survey	2.45%	2.85%	3.88%
research method: mixed	0.95%	0.80%	0.39%

As revealed in Table 2, CAR, JAR, and TAR all depend predominantly on regression analysis as a mode of reasoning (32.85%, 28.78%, 23.56%). However, while JAR’s second most utilized mode of reasoning is analytical modeling (23.22%), CAR and TAR authors favor qualitative reasoning (23.5%, 22.61%). The third most frequently used modes of reasoning for the three journals are descriptive statistics for CAR (13.5%), qualitative reasoning for JAR (10.46%), and analytical modeling for TAR (20.39%). The salient finding in this distribution is that while analytical modeling was among the top three modes of reason-

ing for JAR and TAR, it was not for CAR. This may indicate that JAR and TAR play the role of theory building in the accounting research network.

TABLE 2
Percentages of Papers Using Various Modes of Reasoning

	CAR (x/518)	JAR (x/1207)	TAR (x/1771)
mode of reasoning: descriptive statistics	13.50%	10.02%	9.17%
mode of reasoning: regression	32.85%	28.78%	23.56%
mode of reasoning: ANOVA	2.90%	10.05%	10.10%
mode of reasoning: factor analysis	3.15%	3.10%	2.71%
mode of reasoning: markov analysis	0.15%	0.32%	0.17%
mode of reasoning: nonparametric statistics	2.20%	5.90%	3.73%
mode of reasoning: correlations	1.95%	2.17%	1.78%
mode of reasoning: analytical modeling	11.80%	23.22%	20.39%
mode of reasoning: mixed	8.40%	6.37%	5.39%
mode of reasoning: qualitative	23.50%	10.46%	22.61%

Table 3 demonstrates that CAR and TAR authors devote themselves more heavily to the study of accounting theory (26.2%, 22.15%) while JAR's primary school of thought is the

TABLE 3
Percentages of Papers Studying Various Schools of Thought

	CAR (x/518)	JAR (x/1207)	TAR (x/1771)
school of thought: human information processing	1.10%	9.93%	8.85%
school of thought: other behavioral	1.05%	7.88%	9.00%
school of thought: efficient markets hypothesis	22.40%	22.59%	17.56%
school of thought: time series	3.35%	5.12%	3.34%
school of thought: information economics	4.25%	10.44%	7.20%
school of thought: mathematical programming	0.60%	2.05%	3.44%
school of thought: other statistical models	10.85%	14.71%	12.54%
school of thought: accounting theory	26.20%	15.07%	22.15%
school of thought: accounting history	0.70%	2.32%	2.54%
school of thought institutional	13.15%	2.59%	5.73%
school of thought: other	16.05%	5.12%	7.10%
school of thought: agency	0.40%	2.39%	0.78%
school of thought: expert systems	0.25%	0.27%	0.12%

EMH (22.59%). CAR and TAR authors also focus on efficient markets as their second most studied school of thought (22.4%, 17.56%), while for JAR, accounting theory is the second most studied topic. Finally, the third most frequently studied school of thought for CAR is other topics (16.05%) and for JAR and TAR (14.71%, 12.54%), other statistical models. These results reveal a migration to the EMH as a research topic, consistent with previous research on accounting scholarship [Maher, 1997].

Table 4 reveals consistency in both the first and second most referenced foundation disciplines among the three journals. These foundation disciplines are accounting (CAR=45.35%, JAR=39.39%, and TAR=43.1%) and economics and finance (CAR=36%, JAR=26.98%, and TAR=22.12%). However, there is less consistency in the third most utilized foundation discipline with CAR authors favoring law (5.8%) and their JAR and TAR counterparts choosing psychology (12.95%, 10.24%). These findings are again consistent with earlier results regarding research method as JAR and TAR authors were frequent users of laboratory studies, indicating a behavioral emphasis as confirmed by their frequent use of psychology as a theoretical grounding.

TABLE 4
Percentages of Papers Based on
Various Foundation Disciplines

	CAR (x/518)	JAR (x/1207)	TAR (x/1771)
foundation discipline: psychology	1.30%	12.95%	10.24%
foundation discipline: allied humanities	1.30%	3.15%	3.85%
foundation discipline: economics and finance	36.00%	26.98%	22.12%
foundation discipline: computer technology	0.15%	0.85%	1.90%
foundation discipline: allied mathematics	3.05%	10.12%	6.85%
foundation discipline: statistics	2.80%	3.15%	3.98%
foundation discipline: law	5.80%	0.27%	1.56%
foundation discipline: mixed	2.35%	2.10%	1.88%
foundation discipline: accounting	45.35%	39.39%	43.10%
foundation discipline: management	1.95%	1.27%	4.27%

Table 5 shows that all three journals feature financial accounting as their primary area of research (CAR=46.91%, JAR=56.5%, and TAR=51.27%). CAR and JAR authors focus on auditing (27.8%, 17.9%) and managerial accounting (15.06%, 16.4%) as their second and third foci respectively. TAR authors reverse this ordering, focusing instead on managerial account-

ing (19.88%) and audit (15.3%) as their secondary and tertiary accounting areas of study.

TABLE 5
Percentages of Papers Contributing
to Various Accounting Areas

	CAR (x/518)	JAR (x/1207)	TAR (x/1771)
accounting area: tax	3.09%	2.65%	4.18%
accounting area: financial	46.91%	56.50%	51.27%
accounting area: managerial	15.06%	16.40%	19.88%
accounting area: audit	27.80%	17.90%	15.30%
accounting area: information systems	0.19%	0.75%	1.36%
accounting area: mixed	6.95%	5.80%	8.02%

Results from Analysis of Taxonomic Combinations: Each research paper's characteristics may be described as the combination of taxonomic classifications that apply to that paper. For example, every paper may be characterized by its topical focus (school of thought), its mother discipline (foundation discipline), the function of accounting to which it contributes (accounting area), and the ways by which data are gathered and analyzed (research method and mode of reasoning). Therefore, by analyzing not just the frequencies of use of individual taxons but also the frequencies of various combinations of them, can an analysis of the type of research study most frequently undertaken by accounting scholars be possible.

Cross-Sectional Analysis of Taxonomic Combinations: To determine what types of research most characterize accounting scholarship, composites of the taxonomic characteristics for all papers in the population were constructed. Then, the frequencies of those composites were computed. According to this analysis, the three types of research paper that have been most often attempted over the period of study are:

Papers, that study accounting theory, utilize accounting as a foundation discipline, use internal logic and qualitative argumentation, and contribute to financial accounting (198 papers out of 3,496 in the population that match the ARD selection criteria, or 6% of total papers).

Papers, in which the EMH is studied, are grounded in economics and finance concepts, gather data from primary archival sources, analyze the data using regression statistics, and contribute to financial accounting (185 papers, or 5%)

Papers, in which the EMH is studied, are grounded in accounting as a foundation discipline, use primary archival sources and regression statistics to gather and analyze data, and contribute to financial accounting (130 papers, or 4%)

It could be argued that though there are three groups of papers comprising the list above, these papers actually fall into two categories as the latter two groups may be combined together.

The first cluster of papers is characterized by its focus on accounting theory which is the basic role and fundamental principles of accounting functions and phenomena in relation to industry and the socio-economic milieu. These papers are therefore based on accounting as a foundation discipline, referencing mostly other papers focusing on accounting. In addition to having a distinctive topical focus, the first cluster of papers also has a characteristic methodological approach as well. Rather than gathering empirical data to generate and confirm their findings, authors of these papers use internal logic to do so, deducing from axioms or prior theory to arrive at conclusions. Furthermore, authors of this category of papers use qualitative, verbal argumentation to support their findings which, in addition to mathematical modeling, is one of two modes of reasoning available to works employing internal logic as a research method.

The second category of papers, comprising the second and third groups above, has a very specific topical focus, the EMH. Hence, these papers concern whether and to what extent equity and debt capital markets are affected by accounting information and the manner and timing of its disclosure. These papers are also distinctive in their methodology, based as they are on archival sources, such as the CRSP and Compustat databases for information, and regression statistics for data analysis. The sole difference between the two groups of papers that constitute this cluster lies in their divergent foundation discipline. The second group of papers from the list above feature economics and finance as a foundation discipline while the third group relies upon accounting. Therefore, while the former uses concepts, frameworks, and techniques based in economics and finance research, the latter uses those prevalent in the accounting literature.

Longitudinal Analysis of Taxonomic Combinations: While the preceding analysis permits a summary characterization of the salient features of accounting research, it gives no indication of the longitudinal evolution of these features. Thus, to provide a

means of determining how various types of research have become predominant or yielded to other types over the years, the annual frequencies of papers for each of the taxonomic composites was computed. Then those taxonomic combinations whose frequencies comprised the 99.5th percentile were identified (that is, taxonomic combinations whose frequencies were greater than 99.5% of the frequencies of all other combinations). While it would have been possible to identify the top X most frequently encountered combinations, identification of the Xth rank would be problematic since the number of taxonomic combinations varies for each journal and for each time period. Consequently, determination of the top X composites would be meaningless. On the other hand, the use of the 99.5th percentile to screen for extreme values is a common practice, used in fields as diverse as psychometrics and environmental protection [Ohio EPA, 1997]. Therefore, focusing on the combinations comprising the 99.5th percentile would consistently capture the most dominant combinations, no matter how many there were.

This procedure was done for four distinct time periods (1963 to 1973, 1974 to 1983, 1984 to 1993, and 1994 to 2003) for both the total population of papers in all three journals and for each one of the journals individually. The tables below list the dominant taxonomic combinations as determined above.

TABLE 6**Top Taxonomic Combinations All Journals, 1963 to 1973**

all journals (1963 to 1973)	school of thought	foundation discipline	research method	mode of reasoning	accounting area
178 of 938 papers	accounting theory	accounting	internal logic	qualitative	financial
22 of 938	math programming	allied mathematics	internal logic	analytical	managerial
17 of 938	accounting theory	economics and finance	internal logic	qualitative	financial
16 of 938	accounting theory	accounting	internal logic	qualitative	mixed
15 of 938	accounting theory	economics and finance	internal logic	analytical	financial
15 of 938	accounting theory	accounting	archival primary	regression	financial
15 of 938	accounting theory	accounting	internal logic	analytical	financial

The first table depicts the dominant taxonomic composites for all journals in the time period 1963 to 1973. These 7 combinations are so frequently encountered in the set of papers that their frequencies exceed 99.5 % of the frequencies of all other taxonomic composites.

The dominant school of thought is accounting theory and the dominant accounting area is financial. While foundation discipline and mode of reasoning are diverse, it should be noted that the research method in all but one of these composites is internal logic. This implies that most research in this period did not rely on gathering and analyzing data but on argumentation, whether by verbal discourse or by mathematical modeling.

The next two tables display those taxonomic composites which made up the 99.5th percentile of papers in all journals from 1974 to 1983, and 1984 to 1993 respectively.

TABLE 7

Top Taxonomic Combinations All Journals, 1974 to 1983

all journals ('74 to '83)	school of thought	foundation discipline	research method	mode of reasoning	accounting area
36 of 686	EMH	economics and finance	archival primary	regression	financial
14 of 686	accounting theory	accounting	internal logic	analytical	financial
14 of 686	accounting theory	accounting	internal logic	qualitative	financial
12 of 686	EMH	accounting	archival primary	regression	financial
10 of 686	other behavioral	psychology	laboratory	ANOVA	managerial
10 of 686	EMH	economics and finance	archival primary		financial
9 of 686	HIPS	psychology	laboratory	ANOVA	managerial
9 of 686	EMH	economics and finance	archival primary	ANOVA	financial
9 of 686	other	math	internal logic	analytical	managerial
9 of 686	accounting theory	economics and finance	internal logic	analytical	financial

In both tables, two new schools of thought emerge – EMH and HIPS. Furthermore, the dominant research methods now include primary archival and laboratory studies which are often paired with regression analysis and ANOVA as modes of

TABLE 8
Top Taxonomic Combinations All Journals, 1985 to 1995

all journals ('84 to '93)	school of thought	foundation discipline	research method	mode of reasoning	accounting area
72 of 932	EMH	accounting	archival primary	regression	financial
57 of 932	EMH	economics and finance	archival primary	regression	financial
28 of 932	information economics	accounting	internal logic	analytical	managerial
21 of 932	HIPS	psychology	laboratory	ANOVA	audit
15 of 932	other	accounting	archival primary	regression	audit
14 of 932	HIPS	accounting	laboratory	ANOVA	audit
14 of 932	information economics	economics and finance	internal logic	analytical	managerial
14 of 932	other	accounting	archival primary	regression	financial

reasoning. While other types of papers exist during this period, two specific types emerge as becoming dominant – (1) papers exploring EMH, using primary archival sources and regression statistics, and (2) papers studying HIPS, using laboratory methods and ANOVA.

The next table demonstrates the dominant taxonomic combinations in all journals for 1994 to 2003. In this time period,

TABLE 9
Top Taxonomic Combinations All Journals, 1994 to 2003

all journals ('94 to '03)	school of thought	foundation discipline	research method	mode of reasoning	accounting area
79 of 940	EMH	economics and finance	archival primary	regression	financial
44 of 940	EMH	accounting	archival primary	regression	financial
30 of 940	EMH	accounting	archival secondary	regression	financial
19 of 940	HIPS	psychology	laboratory	ANOVA	audit
16 of 940	other	accounting	archival primary	regression	financial
15 of 940	information economics	economics and finance	internal logic	analytical	managerial
15 of 940	accounting theory	accounting	archival secondary	regression	financial

the two types of papers identified earlier have become completely dominant.

The next three tables drill-down into the population and explore the changes in dominant taxonomic combinations by journal. As in the previous tables, the data are divided into the same four time periods.

TABLE 10
Top Taxonomic Combinations, CAR

CAR	school of thought	foundation discipline	research method	mode of reasoning	accounting area
'84 to '93					
15 of 230	EMH	accounting	archival primary	regression	financial
13 of 230	information economics	economics and finance	internal logic	analytical	managerial
'94 to '03					
19 of 288	EMH	economics and finance	archival primary	regression	financial

Because CAR began publication in 1984, there are no taxonomic combinations identified in the 1963 to 1973 and 1974 to 1983 periods. In the two later periods, consistent with the trend in all journals, CAR began to develop research characterized by a focus on EMH, using archival data sources and regression statistics, contributing to financial accounting.

Table 11 shows that JAR exhibits a similar trend towards research that is focused on capital markets and driven by archival data and regression analysis. However, it also shows an emphasis on HIPS, information economics, and information technology during the 1974-1983 and 1984-1993 periods.

Finally, the changes in taxonomic composite types in TAR papers are summarized in the table below. Once again, the table reveals a migration from research focused on accounting theory and using qualitative methods to research in EMH, using regression analysis of archival information.

While all three journals seem to follow the same trend to market research and to empirical and quantitative methods, some differences become apparent. For example, CAR does not seem to have emphasized HIPS research in any of the time periods under consideration as it was in TAR and JAR.

In summary, the cross-sectional and longitudinal analyses of composite taxonomic profiles reveals that historically, the topical focus of accounting was on accounting theory, and the

TABLE 11
Top Taxonomic Combinations, JAR

JAR	school of thought	foundation discipline	research method	mode of reasoning	accounting area
1963 to 1973					
21 of 269	accounting theory	accounting	internal logic	qualitative	financial
9 of 269	EMH	economics and finance	archival primary	regression	financial
8 of 269	math programming	allied mathematics	internal logic	analytical	managerial
'74 to '83					
22 of 317	EMH	economics and finance	archival primary	regression	financial
7 of 317	other behavioral	psychology	laboratory	ANOVA	managerial
7 of 317	EMH	economics and finance	archival primary	nonparametric statistics	financial
6 of 317	HIPS	psychology	laboratory	ANOVA	managerial
'84 to '93					
33 of 304	EMH	economics and finance	archival primary	regression	financial
28 of 304	EMH	accounting	archival primary	regression	financial
8 of 304	information technology	math	internal logic	analytical	managerial
8 of 304	information economics	accounting	internal logic	analytical	managerial
8 of 304	information economics	accounting	internal logic	analytical	audit
'94 to '03					
31 of 317	EMH	economics and finance	archival primary	regression	financial
14 of 317	EMH	accounting	archival secondary	regression	financial
12 of 317	EMH	accounting	archival primary	regression	financial

methodology was non-empirical and qualitative. However, in later years, the focus shifted to capital markets, with an emphasis on archival sources and regression analysis. Research on human behavior has also become prevalent.

Nevertheless, the earlier non-empirical, qualitative research on accounting theory still comprised the majority of research from 1963 to 2003. However, as empirical, quantitative, market-

TABLE 12
Top Taxonomic Combinations, TAR

TAR	school of thought	foundation discipline	research method	mode of reasoning	accounting area
1963 to 1973					
157 of 669	accounting theory	accounting	internal logic	qualitative	financial
15 of 669	accounting theory	economics and finance	internal logic	qualitative	financial
14 of 669	math programming	allied mathematics	internal logic	analytical	managerial
14 of 669	accounting theory	accounting	internal logic	qualitative	mixed
'74 to '83					
14 of 369	EMH	economics and finance	archival primary	regression	financial
12 of 369	accounting theory	accounting	internal logic	qualitative	financial
10 of 369	accounting theory	accounting	internal logic	analytical	financial
9 of 369	accounting theory	economics and finance	internal logic	analytical	financial
'84 to '93					
29 of 398	EMH	accounting	archival primary	regression	financial
21 of 398	EMH	economics and finance	archival primary	regression	financial
9 of 398	HIPS	psychology	laboratory	ANOVA	audit
9 of 398	EMH	accounting	archival primary	descriptive statistics	financial
7 of 398	HIPS	accounting	laboratory	ANOVA	audit
7 of 398	information economics	accounting	internal logic	analytical	managerial
'94 to '03					
29 of 335	EMH	economics and finance	archival primary	regression	financial
24 of 335	EMH	accounting	archival primary	regression	financial
10 of 335	other	accounting	archival primary	regression	financial
9 of 335	EMH	accounting	archival secondary	regression	financial
8 of 335	HIPS	psychology	laboratory	ANOVA	audit
8 of 335	information economics	economics and finance	internal logic	analytical	managerial

oriented research continues to generate more publications, this dominance is likely to be erased.

METHODS FOR GATHERING AND ANALYZING DATA FOR CITATION ANALYSIS

Gathering Citation Data: Citation analysis is basically concerned with determining which other research a paper has referenced. Thus, the bibliographies of each of the papers published in the three selected journals in the years 1998 to 2003 were examined to determine which other papers had been cited. Counts were made of the number of times a paper in one of the three journals cited a paper appearing in any of the three journals, including cases wherein a paper cited another paper in the same journal (self-citations).

Citation Metrics: Based on the above counts, citation metrics were used to summarize the data. The citation metrics used in this research were adapted from Eagly [1975] and Borokhovich *et al.* [1995]. These citation metrics include the send-receive ratio and the journal-impact factor, both evaluative citation metrics, and the self-feed ratio, a descriptive citation metric.

Eagly [1975, p. 880] defines the send-receive ratio as:

the ratio of the number or proportion of messages sent (the frequency with which the journal is cited by other journals) to the number or proportion of messages received (the frequency the journal cites other journals). High values (approaching or exceeding 1) of the send-receive ratio suggest that the journal is a feeder of network information, while lower values (approaching 0) suggest that the journal is a storer of network information. The high values may perhaps be interpreted as indicative of the journal's innovative role as a well-spring of seminal ideas in the discipline as well as an index of the journal's relative prestige.

The send-receive ratio is calculated by the number of times that any individual journal is cited by other journals, divided by the number of times that journal cites other journals. The resulting quotient is thus a comparison of the journal's influence on other publications, relative to their influence on it. This quotient is therefore increasing in the relative influence of the journal within a research network.

Another evaluative citation metric is the journal-impact factor. Borokhovich *et al.* [1999] used impact factors as an objective

quantitative measure to determine the leading finance journal while Borokhovich *et al.* [1995] deployed impact factors to determine faculty scholarly productivity.

The journal-impact factor is computed as the number of times in a particular year that a journal is cited by other journals, divided by the number of papers published in that journal in the preceding two years. Hence, the resulting quotient is an indication of the extent to which the volume of research a journal has published has generated an impact within the research network. The numerator would be proportionately greater than the denominator for journals whose influence and prestige are more recognized because those journals would be cited very frequently, even if the body of work from which those citations are derived is small. The choice of the number of the preceding two years' papers as a denominator makes the ratio a measure of the recent standing of the journal among citing scholars. It must be noted that the denominator excludes the number of current-year publications because it would probably be too soon to expect these papers to generate a significant amount of citations.

The self-feed ratio, on the other hand, is a descriptive citation metric. It is the propensity of a journal to cite itself and is used in this research as a measure of research integration. The self-feed ratio is calculated as the number of times a journal cites itself, divided by the number of times it cites other journals. Thus, the resulting ratio indicates the proportion at which the information cited by a journal originates from the research published in the journal itself. As discussed later, while this metric is often viewed as a measure of the degree of specialization of a journal, it also is an important indicator of the ability of a journal to assimilate, discuss, and refine its own findings, thereby increasing their validity and significance.

Results of Citation Analysis: The annual number of external citations, published papers, and self-citations of each of the three journals was determined. Based on these counts, citation metrics were computed for each year and the annual counts averaged for each journal.

JAR was revealed to have the highest values for both evaluative citation metrics (send-receive ratio and journal-impact factor). TAR had the second highest impact factor, while CAR had the second highest send-receive ratio. The descriptive citation metric, the self-feed ratio, reveals that CAR authors as a group cite themselves the most, followed by TAR and JAR in that order.

TABLE 13
Citation Analysis Results

Average:	CAR	JAR	TAR
Send-Receive ratio	1.19	3.02	0.86
Journal-Impact ratio	1.93	5.20	4.75
Self-feed ratio	0.23	0.12	0.13

Methodology for Gini Metric and Taxonomic Diversity Analysis: The diversity of the research (in the three journals) is determined by the Gini metric computed over the fractions of papers classified under each of the various classifications in four selected taxonomic categories, the two topical taxons (school of thought and foundation discipline), and the two methodological taxons (research method and mode of reasoning). This is done by summing the squares of the proportions of papers falling under each taxonomic category out of the total number of papers in a journal [Stigler, 1994]. This results in a metric that is closer to zero if it is more diverse and closer to one hundred if it is more concentrated, although some researchers will use an alternative formula of one minus the sum of the squared proportions in order to yield a metric that increases in diversity [Badua, 2008].

Results of Taxonomic Diversity Analysis: JAR and TAR proved to have almost equally diverse arrays of research methods as borne out by their low Gini metric for this taxon (25.45 and 25.93 respectively). CAR proved to be less diverse with a resulting Gini metric of 36.62 for research method.

TAR was the journal with the most diverse set of data-analysis tools with a Gini metric for mode of reasoning of 17.24. Once more, JAR authors' choice of modes of reasoning was only slightly less diverse, resulting in a Gini value of 17.57. CAR's Gini score was the highest at 20.42, indicating that this journal had the smallest and most narrow selection of modes of reasoning among the three journals.

Once again, TAR and JAR authors seemed to have the more diverse topical interests, with CAR articles reflecting less variety in topical foci. TAR's Gini score computed for school of thought (12.75) was slightly lower than JAR authors (12.92), but both were much lower than CAR's (17.64). This indicates that TAR and JAR focused on a broad array of accounting research topics while CAR was more selective.

Furthermore, TAR and JAR drew from more varied sets of foundation disciplines than did CAR. This was proven by their lower Gini scores computed for foundation discipline (25.58 for TAR, 25.72 for JAR, compared to CAR's 34.20).

Overall, JAR and TAR had an average Gini score of about 20 for all four taxons under consideration, meaning that they were about as diverse as one another methodologically and topically. CAR, with an average Gini score of 27 computed over all four taxons, proved to be less diverse.

Table 14
Taxonomic Diversity Results

Gini	CAR	JAR	TAR
Research Method	36.62	25.45	25.93
Mode of Reasoning	20.42	17.57	17.24
School of Thought	17.64	12.92	12.75
Foundation Discipline	34.20	25.72	25.58
Average	27.22	20.41	20.37

CONCLUSIONS AND IMPLICATIONS

Content of Accounting Research: This paper reports the results of a study of mainstream accounting literature over time as an exercise in the study of the development of accounting thought. As such, it has been an effort to analyze and characterize the content and evolution of accounting research. By this characterization, the paper seeks to provide a conception of accounting research over time based on the efforts of those who produce, use, and evaluate it.

The taxonomic analysis reveals that mainstream accounting research is characterized by significant differences in topical emphases and methodological tools. While it has historically been devoted to qualitative studies on accounting theory, this research has evolved to focus on economics and finance using quantitative analysis of archival data. This is consistent with previous research that has documented the strong capital markets and econometrics orientation of accounting research in general. An emphasis on behavioral topics, whether viewed from the prism of information economics or psychology, has also developed.

The findings also suggest differences in the content and evolution of the journals studied. For example, JAR and TAR seem

to have embraced behavioral research to a much greater degree than CAR. Differences also exist among the journals not only in the predominant methods used and topics studied, but also in the diversity of methodologies and topical foci.

Communication and Quality of Accounting Research: In the past, citation metrics could provide only proxy measures of research quality. This is because whereas the frequency that a piece of research is cited, or the number of other research artifacts referencing the cited research indicates the perception of quality that the citing scholars have for the work, it does not capture the specific characteristics that contribute to that positive perception.

Indeed, although they are in the minority, some citations may not actually reflect a positive opinion of the cited research (as is normally the case when a researcher consults the cited work for corroboration or inspiration). This is so when research is cited for the purpose of critique or contradiction. In either instance, the reference appears as a cited item in the bibliography.

Future Research and Recent Developments: Some of the analyses developed in this paper suggest it would be theoretically possible to construct an alternative measure of research quality, one that takes into account the content of the research rather than merely relying on measures of reader perception to proxy for quality. This measure of research quality would consist of a measure of the diversity of a journal's methods and topics and a measure of the extent to which the journal has integrated its findings. Topical and methodological diversity are both important and desirable characteristics as a research outlet that studies a variety of topics and uses multiple methods to prove and corroborate its findings contributes (a) information on a wide variety of issues which is (b) highly likely to be valid, due to triangulation by multiple modes of data gathering and analysis [Robey, 1996; Lewis 1999]. Thus, research is best advanced by a journal that is both topically and methodologically diverse.

Paradoxically, diversity may also be a bad symptom. If a research paradigm is too diverse, it may be a sign of dissent among its scholars and the start of the decay and fragmentation of whatever research paradigm to which these scholars subscribe. This phenomenon is known as incommensurability. That is, "there are no common measures among diverse paradigms of inquiry, so that representatives of different paradigms live in different worlds, hold mutually exclusive beliefs, and use different

vocabularies” to the extent that there is no “meaningful communication” and researchers “risk self-stultification” [Weaver and Gioia, 1994, p. 565]. Thus, researchers who study vastly different topics and/or use radically different methods to study these topics will tend not to communicate, and when there is no active dialogue between constituent scholars, their findings will not benefit from the refinement and validation that communication and collaboration provide.

Therefore, research quality would be expressed as a metric comprised of the interaction of two things: (1) some measure of diversity and (2) some measure of dialogue within a journal. A number of the metrics computed in this paper, such as the Gini and self-citation metrics, could possibly be adapted to the task. In order to determine the validity of this measure, it could be correlated or regressed against other accepted proxies of research quality; for example, the evaluative citation metrics used in this paper. Because this paper only has six years (1998 to 2003) of citation data, such an analysis would have limited statistical validity even if significant results were found. Thus, we leave the final operationalization, implementation, and validation of the metric for future research. With theoretical refinements and additional data, the metric might indeed prove to be a direct means of measuring research quality.

While such a method permits a quality determination that is more direct than traditional citation-based metrics, there are limitations and qualifications which apply. Academic organizations such as the Association for the Advancement of Collegiate Schools of Business (AACSB) and the American Accounting Association (AAA) have recently asserted the need for demonstrating research impact on industry as an essential component of research quality or value. The implication of these recently announced initiatives are manifold [AACSB, 2008]. Is it sufficient to consider and classify research by such measures as citations, when this metric is decidedly biased in terms of measuring work which is “by academics for academics?” In an applied discipline such as accounting, are impact measures not better developed by demonstrations of “real world impact,” and, if so, what measures should be used [AAA, 2009]?

Our paper therefore, while limited in this “real world” element, opens the way for others to study the development of accounting thought over time with a view toward alternative measures of quality and impact. Also, we recognize the nascent character of quantitative metrics as developed herein and encourage continued future research into the development of our

literature with expanding attention to developing the means to improve our understanding of the qualitative and impact factors of our discipline's thought over time without merely relying on indirect proxies such as citation metrics.

Thus, this paper concludes with the idea that research quality may be measured in many ways. However, it may be determined by its content and how it has been communicated. As in human conversations, the quality of the colloquy among accounting researchers depends on the variety of topics discussed, the different ways by which assertions are validated, and the degree to which one meditates upon one's beliefs before sharing them with the world.

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