Of Tribes and Totems: An Author Cocitation Context Analysis of Kurt Lewin's Influence in Social Science Journals

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ABSTRACT

Of Tribes and Totems: Author Cocitation Context Analysis of
Kurt Lewin's Influence in Social Science Journals

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This study used author cocitation context analysis (ACCA) to explore the intellectual structure of two Lewinian social science journal communities. ACCA is a variant of White's (2000) ego-centered citation analysis, in which the focal author name serves as a filter. Articles citing Lewin between 1972 and 2001 in the *Journal of Social Issues* and *Human Relations,* sponsored by Lewinian specialties served as the test bed. Procedures conducted on cited author names—cluster analysis, multidimensional scaling, principal components analysis, and Pathfinder network analysis—generated coherent maps for each journal that maintained a "Lewinian" focus. The maps displayed the range of subject themes of interest to the specialties, which is consistent with Lewin's importance to the specialties.

Classifying all citations to Lewin as Totemic or Substantive assessed citation function. Results were convergent with the MDS maps in that Lewin's work was used most frequently in a Substantive (central) way. Use of Lewin's work did not conform to expectation in that the number of articles citing Lewin increased overall and the proportion of Totemic (peripheral) citations did not increase over the time studied. Analysis of Lewin's works and concepts cited was also congruent with the specialties' subject focus—*JSI* authors focused on social justice issues and *HR* authors used organization and small group research.

I. INTRODUCTION

Analysis of subject domains is one of the major subdisciplines of information science (White & McCain, 1998). Many subject domains in the physical sciences and social sciences have been analyzed using quantitative techniques that describe the formal communication of scientific knowledge and the intellectual structure of specialty groups (White & McCain, 1989, 1998). These quantitative techniques, such as author cocitation analysis, rely on the aggregated consensus of many authors and offer insights that typically surpass those provided by the most knowledgeable single observer (McCain, 1990).

A growing edge of the field is the refinement of citation analytic techniques to portray the intellectual milieu of a single author. For example, White (2000) developed four modes of citation analysis, collectively termed "ego-centered citation analysis," that use an individual author as the starting point for investigation. This innovation contrasts with the usual procedure of a researcher pre-selecting an author set as a judgment sample or producing a set from the top citees in a journal group. One mode of analysis, "citation image," is the aggregated consensus of how citing authors view a focal author's intellectual milieu; that is, the authors most frequently cited with the focal author.

Operationally, a citation image is derived by mapping authors cocited with a focal author by first obtaining a ranked list of the most highly cited authors occurring with the focal author. The researcher then pairs each name on the list with every other name and gathers co-occurrence counts for each name pair from the database. The

results of this type of analysis will "best capture the intellectual substance of the field in which [the focal author] works" by presenting authors whom citers choose along with the focal author (White, 2000).

Buzydlowski (2003), in his research on generating citation image maps in the humanities from a single author name, noted a difficulty arising when cited authors are very highly cited and widely cited in many contexts. When he interviewed experts to validate maps produced in the usual fashion (generating the co-occurrences by choosing a seed name, finding the associated authors, and then finding the co-citation counts within the entire database) he found that the results, though valid overall, were not optimally focused. He gives the example of a name pair, Hegel and Heidegger, associated with Plato. The co-citation frequency for the pair was computed within the entire database, "Hegel AND Heidegger," rather than within those articles that also cite Plato--"Hegel AND Heidegger AND Plato." Buzydlowski suggested that searches constructed tallying occurrences of "Hegel AND Heidegger AND Plato" would preserve the context of Plato's citation image. "Plato" then functions as a filter.

The result of using such a filter is an "author tri-citation analysis." Marion (2002) applied this technique in a pilot study that mapped the intellectual milieu of a focal author, the seminal social scientist Kurt Lewin. The author tri-citation technique, a form of "contextual cocitation,"[1] preserved the context of links to Lewin by mapping authors cocited with Lewin in relation to each other *within the context of their appearance with Lewin*. The pilot study was based on approximately 6000 citations

[1] Roger McCain suggested the term "contextual cocitation" to generally describe using a filter to preserve the context of citations. Howard White suggested "author cocitation context analysis."

occurring in the three Institute for Scientific Information databases between 1972 and 2001. The present research sought to use this technique in order to provide targeted maps of intellectual structure for two journal communities, each represented by authors cited in a single journal.

Generating well-focused ego-centered citation image maps would be especially valuable in the social sciences because of the balkanized nature of these specialties. "Social science areas with strong political factions or 'schools of thought' may be particularly problematic" for constructing maps of intellectual structure (McCain, 1990, p. 434). The structure of scholarly communication in the social sciences differs in several regards from communication in the physical sciences and in the humanities (Line, 1981; Griffith & Small, 1983; Meadows, 1998). For example, the "Kuhnian" model of a paradigm change, in which a new framework replaces an established conceptual framework and its information content, seems not to occur in the social sciences (Meadows, 1998). In the social sciences, the old and the new paradigms are likely to coexist rather than one replacing the other (Mullins, 1977). In other words, the social sciences do not re-center and then proceed from a single overriding, agreed-upon theoretical framework. Rather, the social sciences center and proceed from multiple paradigms (Griffith & Small, 1983). Joravsky (1989) expressed a similar thought: "Constructing a history of the human sciences is quite different from recapturing the history of the natural sciences, for consensus on basics is lacking both in the past and in the present" (quoted in Farr, 1996).

Social scientists often view their research questions and methods within a framework developed by key authors, "founding fathers" or "founding mothers," who assume a "patriarchic" or "matriarchic" role within a specialty or "school of thought." A social scientist is, thus, likely to carry an identifying, eponymic label, such as "Freudian" or "psychoanalytic," "Rogerian" or "client-centered," "Skinnerian" or "behaviorist," as a badge indicating intellectual allegiance and group membership. A citation map is likely to be most useful to a social scientist when it is generated in a way that uses the "lens" through which she or he views the field of endeavor (Tijssen, 1993). Hjørland & Albrechtsen's (1995) assertion that "the most fruitful horizon for IS is to study the knowledge-domains as thought or discourse communities" is particularly relevant for studying the intellectual structure of social science specialties.

Take for a hypothetical example generating a map portraying the well-known psychologist B.F. Skinner's citation image. Authors highly cocited with Skinner include equally famous authors Freud and Piaget, who represent opposing theoretical models. Gathering cocitation counts for the name pair "Freud AND Piaget" by themselves (the standard procedure in cocitation analysis) will probably lose the association with Skinner because Freud and Piaget, considered cognate with each other, are cited in contexts that have no connection to Skinner. The resulting map of Skinner's citation image is not optimally expressing a "Skinnerian" perspective. It would not be a "Skinner-centric" map. This is not to imply that such an aggregated map would be invalid or useless. Rather, the assumption here is that adherents of

social science theory groups are likely to value maps congruent with their views of the intellectual world.

Two examples taken from the present research might help to further clarify this matter. If a researcher conducts a cited author search in the SSCI on B. F. Skinner (the founder of operant conditioning behaviorism) and A. Bandura (identified with social learning theory), she will retrieve 1149 documents. The subject of many of these documents focuses on reinforcement strategies and aspects of social learning theory. A cited author search on Lewin, Skinner, and Bandura retrieves 75 documents. The Lewinian perspective is reflected in a focus on group strategies, system focus, and environmental influence in the retrieved documents.

Another example is that a cited author search on H. Simon and K. Weick, both prominent in the organizational management literature, retrieves 796 documents. The subjects of these documents concern industrial psychology (Weick's specialty) and cognitive science (associated with Simon), staffing outcomes, entrepreneurial expertise, etc. A search of Lewin, Simon, and Weick retrieves 50 documents. This document set deals with organization theory and communication, environmental uncertainty, small group studies, and the individual change process. Although the number of documents retrieved from this filtered search is obviously much smaller than that obtained from the usual cocitation procedure, it offers an advantage. The filter affords retrieval of a rich data set tailored to interpretation of intellectual networks from the perspective of a focal author.

One goal of this study was applying the cocitation context technique, specifically author cocitation context analysis, to interpret the intellectual structure of two "Lewinian" journal communities. One journal is concerned with the application of psychological research to social problems; the other journal concentrates on organization studies. Lewin was a particularly good subject for this study because (as discussed in Chapter II.3) several specialties regard him as their "founder." Just as the pilot study produced a "macro-level" map of intellectual structure from a "Lewinian" perspective, these journal studies represented "micro-analyses" roughly corresponding to two subject clusters in the pilot study. The document sets were a particularly rich test bed for studying specialties because of the journals' affiliation with "Lewinian" journal communities.

Although the social sciences are particularly well-known for organizing around schools of thought, some describe the structure of all scientific disciplines as "tribal" to indicate the array of rituals, membership rules, totems, specialized languages, etc. that characterize them (Campbell, 1979; Becher & Trowler, 2001). Given such observed differences in specialties, it is not surprising that Peritz (1983) noted, "The manifest roles of citations differ from one field to another…" (p. 303). Several researchers marked the phenomenon of social scientists' tendency to cite foundation papers as an indication of the citing author's perspective or orientation rather than as an indicator of the cited author's specific methods or results (Hargens, 2000; Cozzens, 1985; Bazerman, 1988). That is, the citing author establishes the pedigree and value of his/her work by anchoring to its intellectual foundations.

Hargens termed the function of these orienting citations "totemic representations." This resembles a tribal member using a totemic symbol to denote kinship with ancestral origins, manifested in this case by social scientists' self-identification in eponymic labels. In the social sciences, the begetting is intellectual. Hargens' distinction between substantive and affiliative citations is congruent with other research on citation context analysis (described in the Review of the Literature).

The question arose whether analyzing the role or function of citations to a focal author would enhance interpretation of the author's citation image and, in turn, enrich interpretation of a group's intellectual structure. The interaction of citation function and cocitation mapping has not been widely examined. Small & Greenlee (1980), looking at documents rather than authors, suggested that combining citation context analysis and cocitation clustering might provide detailed insight into the cognitive structure of a research specialty. McCain & Turner (1989) compared the citation context and aging patterns of highly cited papers in molecular genetics. They concluded that the most highly cited papers are those that became the concept symbols for important research methods or experimental materials. They note that their results are congruent with studies by Peritz (1983) and Small (1978).

Because authors use citations for different functions, partitioning citation function should help to augment analysis of intellectual structure. For example, would a more nuanced picture of Lewin's role emerge from partitioning citations according to their function as "totemic" versus "substantive?" Several commentators have observed that Lewin's contemporary role is largely as a metatheorist or as a "founding father"

rather than stemming from his specific findings or methods. An analysis of citation function could clarify Lewin's role. Finding a small proportion of "substantive" citations to Lewin would support the conclusion that Lewin's primary role in the specialty is "founding father." On the other hand, finding a preponderance of "substantive" citations would indicate that Lewin's results and/or methods remain salient.

An additional factor might be relevant for understanding citation function. Previous research on citation context found that over time citations change from substantive discussion of a paper to a standardized, abbreviated concept symbol (Cozzens, 1985; Small, 1978; Hargens, 2000). Thus, if "totemic" citation occurs, it is likely to increase over time. In the case of Lewin, one would expect that citations made closer to publication of Lewin's work (articles published decades ago) are more likely "substantive." Conversely, citations occurring in articles dated further from publication of Lewin's work (more recently published) are more likely "totemic." The results of previous research indicating the salience of citation function and Lewin's undisputed position as a "founding father" in several specialties argued for exploring the role of citation function over time.

Finally, assessing the specific Lewinian concepts authors use provided another opportunity to amplify the portrait of intellectual structure that emerged. Lewin's ideas and research were published in several anthologies and articles, which made tracing the use of specific concepts, rather than simply published works, useful.

The goal of this study was to derive focused representations of intellectual structure for two journal communities in the social sciences. This research combined

variants of cocitation context analysis and citation context analysis, namely, author cocitation context analysis (ACCA) and citation function analysis, respectively. These techniques were used in this study to generate a focused portrait of two scholarly groups' intellectual structure with a "Lewinian" context.

This study attempted to answer several questions. What is the intellectual structure of two "Lewinian" journal communities? Does partitioning citations according to "totemic" and "substantive" functions increase our understanding of intellectual structure for these specialties? What is the function of citations to Lewin over time? What concepts do authors citing Lewin find relevant for their work? The next chapter presents the research questions and the rationale for studying journals closely associated with Lewin.

II. THE PROBLEM

II.1. Rationale for the Study

As discussed in the Introduction, social science specialties frequently organize around the theoretical and/or methodological work of a "founding father." Writers have likened the specialties to "tribes," noting that, in addition to possessing basic components of culture, i.e., language, customs, and artifacts, social scientists also regard their founders as intellectual "totems." Research has determined that social scientists cite the "founders" at a much greater rate than do authors in other areas of science. A type of citation, labeled "totemic representation," serves as a signal to readers of the citing author's orientation or approach, in effect, indicating the citing author's intellectual affiliation or "tribe."

This study investigated the phenomenon of "totemism" and explored how analyzing evidence of this citing behavior would aid in understanding intellectual network structure. The supposition was by doing so one could also address the problem of citation maps not optimally representing experts' perceptions of their specialty. The goal, then, was to explore creating more focused maps and thus, more accurately represent the intellectual structure of scholarly communities particularly when creating ego-centered cocitation maps.

Author cocitation analysis provides a picture of the intellectual terrain of a journal community with the author representing the *oeuvre*. Analysis of an author's citation image brings a focus on the intellectual milieu of cited authors as seen by citing authors. The vehicle for studying "totemic representation" was case studies of two

journals. Citations to Lewin in journals sponsored by specialties historically associated with Lewin provided a test bed for this study of citing behavior and intellectual structure in the social sciences.

II.2. Statement of the Problem

This research had several goals. The overriding objective was to explore the intellectual structure of social science journal communities by enhancing and refining cocitation mapping. The recent innovation of constructing ego-centered (meaning from a single author name) cocitation maps, (e.g. White, 2000; Buzydlowski, 2003) is especially relevant to the social sciences because these specialties typically cohere around an individual theorist or "school of thought." This study's supposition was that constructing maps that represent intellectual structure from the perspective of such a group would provide an insider's view of a specialty.

Some subject experts evaluating ego-centered citation maps have raised cautions. They remarked that the maps, while valid, did not optimally represent their views of intellectual relationships in cases where the focal author was highly cited in many contexts (Buzydlowski, 2003). One way to increase the focus of an ego-centered map is to conduct an author cocitation context analysis (ACCA) in which cocitation counts always include the name of the focal author as well as name pairs—author X AND author Y AND author Z. Thus, ACCA is a variant of author cocitation analysis in which the focal author serves as a filter. A pilot study investigating the citation image of Kurt Lewin used this technique, which resulted in maps of intellectual structure with a "Lewinian" perspective. The initial research (Appendix A) included "all

science" (defined by selected authors included in the three Institute for Scientific Information databases).

The present research extended the pilot study by applying author cocitation context analysis to authors citing Lewin in two journals, each sponsored by a social science specialty closely associated with Lewin. The authors cocited with Lewin in these "Lewinite" journals approximate two clusters in the pilot study. An ACCA of articles citing Lewin in the journals provides a "Lewinian" perspective of intellectual structure—intellectual relationships among authors solely in the context of cocitation with Lewin.

Another objective of this research was to clarify the influence of citation function on intellectual structure. Hargens (2000) determined that social scientists are much more likely than are physical scientists or humanities scholars to cite a specialty's founders in their work. In the current study I examined the function of citations to Lewin by: (1) categorizing the function of citations to Lewin, (2) determining how function changes over time, and (3) assessing which concepts citing authors find relevant to their work.

Finally, a number of observers published differing assessments of Lewin's role in contemporary social science. The results of this study helped to clarify Lewin's role in two research areas by providing additional perspectives generated from the bibliometric analyses.

II.3. The Case of Kurt Lewin

The social scientist Kurt Lewin (1890-1947) and his work provided an excellent focus for investigating intellectual structure in the social sciences. Lewin is one of the pre-eminent social scientists of the twentieth century and widely regarded as the "father" of small group research (Gold, 1999). The scope of Lewin's interests and contributions is quite broad: "philosophy of science; social, developmental, personality, motivational, cognitive, and clinical psychology; social organization; social problems; and scientific methodology" (Gold, 1999, p. ix). Scott (2000), in recounting the history of Social Network Analysis, describes Lewin's ideas as providing one of the intellectual foundations for the development of that field. In a study of communication scholars, Lewin was ranked 57th and number 37th on two measures of the 120 most influential scholars (Beniger, 1990). Rogers (1994) includes a chapter on Lewin as one of the principal figures in the history of the communication discipline. A recently published poll of the most influential psychologists of the twentieth century listed Lewin as eighteenth (Haggbloom, 2002). Prominent figures, such as Edgar Schein (1996) in Organization Development and Leon Festinger (1980) in Cognitive Psychology, credit Lewin's profound influence on their work.

Lewin is widely known for the development of Field Theory (1936, 1938) and for his experimental studies of group climate and authority (1939). He also developed the practice of action research (1946), conceptualized the notion of cognitive structure (1936), formulated the concept of the information gatekeeper (1943), and coined the

statement "There is nothing as practical as a good theory" (1951b, p. 169). All are now part of the common vocabulary in psychology (Deutsch, 1968; Rogers, 1994). These concepts are also salient in Information Science. Cognitive structure, environmental and context sensitive user modeling, action research, and learning communities are prominent concepts in the information science literature that originated with Lewin.

Many observers may be unaware that these innovations originated with Lewin because these contributions are widely associated with other authors, or the ideas are so thoroughly assimilated into the literature that they are no longer cited. Garfield (1975), building on Merton's (1969) concept, referred to this phenomenon as the "obliteration phenomenon," whereby one's ideas are adopted so completely into discourse that any connection with the originator is lost. Action research is a particularly good example of Lewin's ideas often losing any association with the name of its creator. This would argue that assessing Lewin's prominence with citation counts is quite likely to underestimate his influence.[2]

Some of Lewin's contributions are widely associated with other authors. Graumann (2002) points out that, although Lewin's strictly individual contributions may be hard to identify, "psychological knowledge today owes a great deal to names such as Barker, Cartwright, Dembo, Festinger, French, Hoppe, Karsten, Kelley, Lippitt, Ovsiankina, Pepitone, Thibaut, Zeigarnik (an alphabetical, hence arbitrary,

[2] The "obliteration phenomenon" also raises the question of the meaning of Lewin to those authors that continue to cite him, which is a question for future study.

order of students and colleagues who worked with Lewin).” Schein (1996) notes Lewin’s uncited but profound influence.

> Few people have had as profound an impact on the theory and practice of social and organizational psychology as Kurt Lewin. Though I never knew him personally, I was fortunate during my graduate school years at Harvard's Social Relations Dept. in 1949-50 to have been exposed to Alex Bavelas and Douglas McGregor, who, in my mind embodied Lewin's spirit totally. … Lewin's spirit and the assumptions that lay behind it are deeply embedded in my own work and that of many of my colleagues who practice the art of ‘Organization Development.’ I have deliberately avoided giving specific references to Lewin's work because it is his basic philosophy and concepts that have influenced me and these run through all of his work as well as the work of so many others who have founded the field of group dynamics and organization development.

Other writers claim that Lewin’s influence on various social science disciplines is as a meta-theorist, who provided a general orientation and basic concepts rather than empirical findings or specific theoretical contributions (Deutsch, 1968; Jones, 1998). Graumann (2002) wrote, “Lewin is not only an author's name; it is also a brand name for products of the interaction between Kurt Lewin and his associates.”[3] Other authors disagree, asserting that Lewin’s direct influence has diminished as small group communication and behavior studies have become passé (Rogers, 1994). Mullins (1973), in his study of the development of theory groups in sociology, titled the chapter on Small Group Theory, “The Light that Failed”, to indicate a theory group that failed to develop into a scientific specialty. He attributed one cause of that failure to Lewin’s premature death vacating a leadership position not filled by a successor. Lewin’s most well known student, Festinger (1980), wrote that authors rarely cite Lewin’s ideas and research after 1960.

[3] This assertion is quite congruent with the citationists’ claim that an author’s name represents an *oeuvre*, as well as an individual.

Contrary to some opinions expressed above, the evidence is that Kurt Lewin's contributions continue to exert a significant impact on the formal communication structure in the social sciences. A cocitation context analysis of authors cocited with Lewin revealed that: (1) authors continue to cite Lewin, and (2) they cite him in new disciplines (Marion, 2002). Indeed, there are approximately 6000 citations in the Institute for Scientific Information (ISI) citation indexes between 1972 and 2001. (Appendix A contains a copy of the study.) One indication of Lewin's influence is the use of the eponymic "Lewinian" in 215 unique records in five Dialog OneSearch databases (PSYCH, MEDICINE, EDUCAT, MANAGE, CONFPAP).

Lewin's role as the founder of several specialties as well as the range of opinions about the contemporary influence of Lewin's contributions makes him an excellent subject for studying the role of "totemism" and intellectual network structure. Although Lewin's contributions have been the subject of a number of reviews, books, and conferences, the breadth and depth of analysis revealed by a cocited author analysis is beyond that which even the most experienced and insightful observer can offer (McCain, 1989). One goal of this research was to clarify the contemporary intellectual milieu of Lewin's work as demonstrated in "Lewinite" journals.

II.4. Research Questions

This section presents the study's research questions and the results anticipated from answering them. This exploratory research contained broadly framed questions to permit discovery of new insights. Figure 1 Schema of Research Questions, located at the end of this chapter, presents a summary of the research questions and methods.

Chapter III Review of the Literature discusses previous relevant research. Chapter IV Research Design describes the operationalizalized research questions and specific methods necessary to execute the study.

Research Question 1: Author Cocitation Context Analyses of Intellectual Structure

Author cocitation analyses of scholarly communities display network structures that inform the reader about perceived relationships among cited authors and subjects by authors who cite them. The pilot study demonstrated that author citation context analysis is an effective means of determining intellectual structure with a focused, in this instance "Lewinian," point of view. This part of the research asked the general question:

> Can author cocitation context analysis create maps
> of intellectual structure that bring into focus
> the "Lewinian" perspective of a journal community?

Author cocitation context analyses of articles from "Lewinite" journals serve as the method for "micro-level" analyses of Lewin's citation image. The research question is:

> **What intellectual structures emerge from author**
> **cocitation context analyses derived from citations**
> **to Lewin in specific "Lewinite" journals? (R1)**

Expectation: These focused "micro-level" analyses of journal communities depict the subject themes and authors within the Lewinian context; that is, the structure of the field as viewed by authors citing Lewin.

Research Question 2: Function of Citations to Lewin

Hargens' (2000) finding that behavioral scientists disproportionately cite classic works as "totemic representations" suggests that accounting for the function of citations to Lewin (partitioning "totemic" use) might offer a means for a deepened understanding of intellectual structure. Does accounting for citation function in journal literature allow for a more nuanced view of a community's intellectual structure? What are the ideas for which Lewin is cited? The evidence obtained thus far argued for research that explored the association between intellectual structure and citation function. This part of the research asked:

> Does analysis of citation function increase understanding
> of intellectual structure?

In order to clarify whether assessing the function of citations to Lewin influences the analysis of intellectual structure, several steps were necessary. The first research question related to citation function focused on determining the frequency of totemic and substantive citations to Lewin in two specialties.

What is the relative frequency of totemic and substantive citations to Lewin in "Lewinite" journals? (R2a)

Expectation: Based on published statements, the expectation was that authors writing in "Lewinite" journals are likely to cite Lewin more frequently as a "totemic representation." "Substantive" citations to Lewin, referring to specific methods and/or results, are likely to occur less frequently but when occurring are likely to indicate the portions of Lewin's work used in contemporary social science.

Previous research found that the use of citations changed over time, shifting from a focus on specific findings or techniques to a generalized acknowledgement of previous research, suggesting that totemism increases with the time between original publication and subsequent citation. A second research question related to citation function was:

Does the relative frequency of totemic and substantive citations to Lewin change over time in "Lewinite" journals? If so, how? (R2b)

Expectation: The expectation was that, over the time studied in this research, use of citations to Lewin would not change very much because published accounts indicate that, because it is a long time since Lewin died, many social scientists regard Lewin as a "totemic" figure during this period.

"Totemic" citations can signal that the citing author is paying homage to a founder or a signal to the reader of the writer's general orientation. "Substantive" citations indicate that the citing author uses the cited work as a central part of his or her paper. Which concepts do citing authors find relevant? A third research question based on citation function was:

What concepts from Lewin's work do authors cite? (R2c)

Expectation: According to published accounts, Lewin's work serves as part of the intellectual foundation for several specialties. Determining which concepts citing authors find relevant for their work would aid in understanding the intellectual network among authors writing in a journal.

Research Question 3: Clarification of Lewin's Role

A previous author cocitation context analysis of Lewin's citation image created a "macro" view demonstrating that, over the period studied, he remains highly cited in several disciplines. As noted above, published accounts vary in their views of Lewin's role in contemporary social science. The author cocitation context analyses created maps of structure that preserved the context of citations to Lewin. The citation context analysis provided indication of the uses that authors make of Lewin's work. Taken together, the two analyses offered some clarification of Lewin's role. The research question was:

Is there congruence between intellectual structures obtained from bibliometric analyses and that found in published portrayals of Lewin's role in contemporary social science? (R3)

Expectation: The result was that examining the citations embedded in the text with the relevant content provided additional information with which to evaluate published accounts.

II.5. Limitations of the Study

This project had a number of limitations arising from: (1) the cocitation methodology, (2) the citation context methodology, and (3) the design of this study.

A. Limitations of Cocitation Analysis

Cocitation analysis has amply proved its worth in describing a subject domain. The particular value of this methodology is that its analysis depends on empirical evidence—the actual use of literature by authors. Additionally, the measure of literature use depends on the consensus of a large group of citing authors and not the view of a single observer. Cocitation maps have consistently revealed many facets of the intellectual network structure of subject fields.

Any methodology, however, has limitations. Several limitations of cocitation analysis spring largely from its dependence on large databases privately owned by the

Institute for Scientific Information (ISI). These databases are expensive to use and a user's access is limited to the amount of coverage paid for by his institution. Coverage of journals in the databases is substantial but not complete. While ISI makes efforts to include the most important journals on a subject, the company does not index all journals or other influential sources, such as books and conference papers.

In addition, the database indexes only the first author of a cited work. This limitation can affect the results significantly in cases where multiple authors are common, such as the natural sciences and some social sciences. The undeniable effect is to underestimate the influence of second and subsequent authors, which can result in skewed analyses of intellectual structure. McCain (1988) found that cocited author searching does capture a large percentage of relevant documents in broad subject retrieval but recall can be improved by including coauthor names. This limitation is somewhat mitigated for the journals used in this study, since an examination of the articles in the data set showed an average of 1.4 authors per cited article in the *Journal of Social Issues* and 1.6 authors per cited article in Human Relations.

The *piece de resistance* of a cocitation analysis is the visual representation of structure, frequently termed a map. These graphical depictions of intellectual structure tend to be visually striking and relatively simple to interpret. One caution, however, is that a single map illustrates a representation that could be drawn in several different ways. The actual placement of data points, data labels, etc., can influence interpretation of a map. The quality of cocitation maps also depends on the choice of authors, journals, or documents.

The researcher must carefully choose the units of analysis to meet the objectives of the research. The time between publication of a work and its appearance in references as well as the lag between submission and publication makes cocitation analysis a lagging indicator. The extent of the time lag is, therefore, dependent on several factors including those just mentioned plus the date range used for analysis. In this study, retrieving data for a range of thirty years means that more recent developments are less likely to be immediately visible. The pilot study (Appendix A) divided the thirty-year range available for the citation databases into two. Important shifts in the intellectual landscape could be observed from one period to the other. If the researcher retrieves data for the most recent few years, the analysis is more likely to reflect the current state of affairs.

Finally, a valid but relatively minor limitation is that cocitation methodology is time-consuming and complex, although researchers consistently work to develop techniques for streamlining and automating data collection and analysis.

B. Limitations of Citation Context Analysis

Citation context analysis and citation content analysis are closely related approaches to the study of how scholarly papers incorporate material from earlier works by examining the surrounding bibliographic references. Small (1982) surveyed the ways in which researchers examined the functions of citations in texts and concluded that there are two separate but interrelated approaches to the analysis of citation function. The first approach, citation context analysis, “classifies the types or functions of references in scholarly texts.” The second, citation content analysis,

examines the "uses of the semantic content of the citing passage to characterize the citing work." In practice, citation context analysis often includes some aspects of citation content. Although researchers have not used citation context and content analysis as extensively as cocitation analysis, a substantial body of research has applied these methods. These approaches would seem ideally suited to the study of information science questions, which generally take the form of analyzing written records.

Limitations that apply to content analysis also apply to context analysis. The first limitation pertains to selection of the sample. In cases where the researcher cannot study the entire population, careful selection of the sample analyzed is critical to ensure that the sample is representative of the population. Random sampling is the best technique to eliminate bias. When the sample is not randomly drawn, it is not possible to generalize to the population in question (Babbie, 1998). In the present research all of the citations to Lewin in the subject journals were analyzed, not a sample.

Allen & Reser (1990) point out a number of limitations in the use of content analysis in library and information science research related to the data classification scheme. "Categories should meet the criteria of exhaustivity, exclusivity, clarity, and validity. [T]he categories should be exhaustive, mutually exclusive, clearly defined, and conceptually valid in relation to the research questions" (p. 257-258). They emphasize the importance of either pretesting categories or using categories applied successfully in other studies. Small (1978) noted that few authors, in constructing classification schemes, paid attention to the work of previous researchers, choosing

instead, to construct a different set of categories. It is reassuring that Small found, despite terminological differences, that the schemes had some "striking parallels" and even some quantitative "regularities." This study adapted a classification scheme previously used by McCain and Turner (1989).

Bias introduced by the individuals coding the data is an important issue in context and content analysis. The assignment of citations to categories is subjective. In order to minimize the influence of coder bias, more than one coder should categorize citations (Allen & Reser 1990). This research employed two coders, who independently classified the citations. The coders then compared their results, discussed and resolved differences.

C. Limitations of the Study

This study was limited in a number of ways. The project was exploratory; very little research has examined the influence of citation function on cocitation analysis. Small & Greenlee (1980) combined citation context analysis and cocitation clustering, and concluded that this may provide an avenue for exploring the structure of paradigms.

White (2000) and Small (1974) developed the concept of tri-citation analysis. They did not implement this technique in the way it was used in this study. White's (2000) paper on ego-centered citation analysis discussed using cocitation context analysis but Buzydlowski's (2003) research derived his results from a ten-year run of the Arts & Humanities Citation Index, deemed too small for a cocitation context analysis.

The theoretical basis for this proposal rests on the assumption that journals chosen for analysis provide a window into the specialties; that is, that the journals sponsored by these specialties are congruent with the research interests of the specialties. This study focused on the implications of citing a specialty's "founding father" in that specialty's journal and representing those citing authors' view of structure. It assumed that authors citing Lewin in "Lewinite" journals are at least nominally "Lewinian," that is, members of the "Lewinite" specialty. The study did not attempt to portray structure for the journal as a whole but for a segment of authors cited.

The researcher's judgments were the basis for selecting the journals. Any results are limited to the journals studied and cannot be considered generalizable; however, they allow for development of hypotheses in this and other areas.

II.6. Definition of Terms

The previous section presented the research questions that orient this study. Below are summary definitions of significant terms used in this project. The Review of the Literature (Chapter III) discusses concepts and terms in depth. Research Methods (Chapter IV) describes the operational use of these terms.

Citation context and content analysis: Determining how scholarly papers incorporate material from earlier works by examining the bibliographic references located close to a citation (Hargens, 2000; Small, 1978, 1982; Peritz, 1983; McCain & Turner, 1989). Small (1982) defined citation context as the "particular passage or

statement within the citing document containing the reference" and citation context analysis as "any attempt to utilize these passages in a systematic fashion." The citation context is the portion of the citing document containing the citation and systematic examination of citation contexts is citation context analysis. In the same review Small lists two approaches to citation context analysis: (1) classification of the function of references in scholarly texts, and (2) use of the semantic content of the citing passage to characterize the cited work. He observed that in practice the two approaches frequently overlap. "Citation context studies devise a classification scheme based on a text analysis in order to determine the inter-document relationship in the presence of the reference citations…" (Liu, 1993). McCain & Turner (1989) emphasized that with citation content analysis "the researcher seeks to identify the concepts for which the key paper is cited, rather focusing specifically on the context in which the paper is used."

Citation function: Used to describe how authors use colleagues' work as opposed to determining the citer's motivation for citing (Hargens, 2000; Small, 1978, 1982; Peritz, 1983; McCain & Turner, 1989). The function of citation to older foundation papers in many social science papers is a signal to the reader about the citer's orientation or general approach instead of a citation for specific results or methods. Citation function is often assessed by means of citation context analysis.

Citation image: Term introduced by White & McCain (1998). Citation image is a profile consisting of all authors cocited with a focal author in reference lists with data

derived from the ISI databases. The frequencies of their joint occurrence in publications across databases are cocitation counts that typically form a core-and-scatter pattern. Author cocitation analysis (below) derives from citation images (White, 1990a, 1990b; McCain, 1990). The pilot study for this project (Marion, 2002) is an author tri-citation analysis of Lewin's citation image; that is, the intellectual structure of pairs of authors who are cited with Lewin in the ISI databases.

Cocitation analysis, author cocitation analysis (ACA), author cocitation context analysis (ACCA): Pioneered by Small (1973), cocitation occurs when two documents are cited together in the reference listing of a subsequent third work. Author cocitation analysis, developed by White (1981) and White & Griffith (1981a, 1981b), involves using cited authors as the unit of analysis. In this study, authors cited with Lewin are the basis for the ACCA; in the language of Dialog searching, "CA=Lewin K" is "anded" with all pairs of authors. This technique compensates for very highly cited authors being cited broadly across the intellectual landscape by ensuring occurrence with the focal author limits the data collected (Marion, 2002). Cocitation analysis and ACA typically use a range of multivariate techniques: cluster analysis, multidimensional scaling, PFNets, and factor analysis, to derive the intellectual structure of scholarship.

Formal communication network: Information exchange through formal archival channels, such as scholarly journals and other publications (Garvey, 1979). Cocitation

analysis measures the formal communication networks representing the intellectual structure of the focal group (McCain, 1990).

Intellectual structure: The pattern of relationships among cited authors in a sample of scholarly literature; "the consensus on past literature" derived from the aggregated use of literature by citing authors (White & McCain, 1998). Over time, authors exhibit patterns in how they judge other writings. Cocitation mapping portrays the structure of these relationships.

Journal community: Authors publishing in a scholarly journal. This research examines the intellectual structure of authors citing a specialty's "founding father" in a journal sponsored by the specialty. Although a journal provides a window into the research interests of the sponsoring group, not all contributing authors would necessarily claim membership in the same specialty. This study dealt with a portion of two journal communities who cited Lewin.

Research specialty: A group of scholars working on a specific set of related problems. Various authors define this term differently with little agreement. Campbell (1969) identified specialties as the basic unit of intellectual organization although Whitley (1984) disagreed because of the high degree of instability and change of specialties. Griffith & Mullins (1972) identified a spectrum from loose confederations to highly cohesive groups. The loose confederations were associated with a shared field of professional practice or area of content while the highly cohesive groups

organized around a new or different theory or methodology. Law (1976) divided specialties into three categories: theory-based, technique- and/or methods-based and subject matter. Becher & Trowler (2001) place specialties "between broad knowledge fields at one extreme, narrow specialisms at the other, and disciplines poised uneasily between the two." SPSSI and the Tavistock Institute fit the definitions of specialty as defined above. This research, however, focused on a subset of authors publishing in a specialty's journal and citing an important figure in the specialty but did not study the specialty as a whole.

Totemic representation: A citing convention followed by social scientists, in which authors cite the founders of a specialty for the general approaches they initiated rather than for any results they reported (Hargens, 2000). Others researchers noted a similar citing convention, which they labeled "paying homage to pioneers" (Weinstock, 1971) and "ceremonial" (Cole, 1975).

II.7. Summary

This chapter explains the rationale and goals for conducting this study of formal communication networks in social science specialties and presents evidence to support using authors who cite Kurt Lewin as the focus. This chapter also delineates research questions and the expected results. The last section listed definitions of significant terms used in the research. The next chapter reviews relevant literature.

Schema of Research Questions and Methods

RQ1. Intellectual Structure

Author cocitation context analysis: "Lewinian" perspective derived from set of authors highly cocited with Lewin. Two levels of granularity: across science (***pilot study***) and two "Lewinite" journal communities as represented by cited authors in journals (***RQ1***)

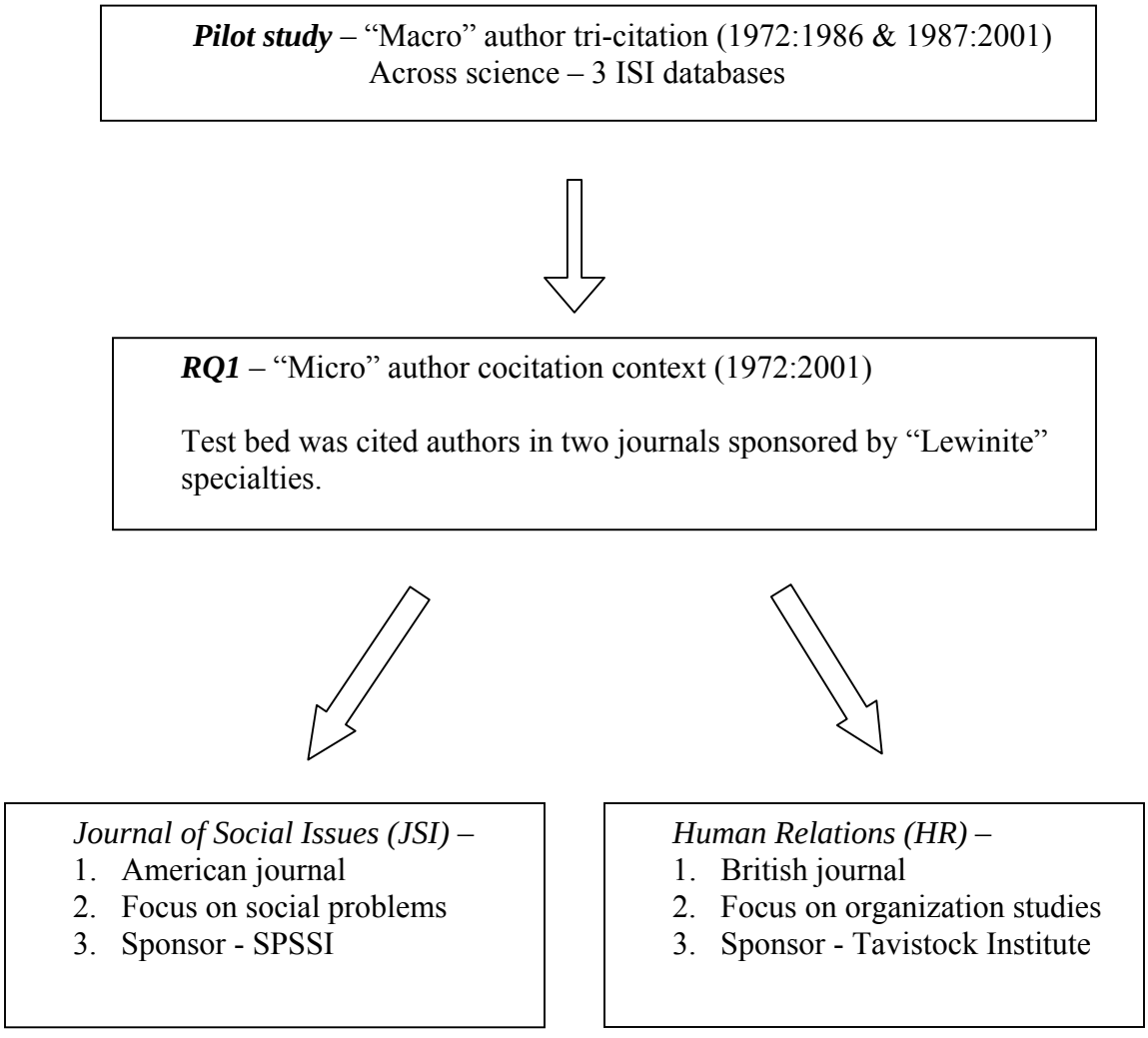


Figure 1. Schema of Research Questions and Methods

RQ2. Citation Function

Based on Hargens' concept of references used as "totemic representation" (general orientation / perspective) vs. substantive (specific / detailed)

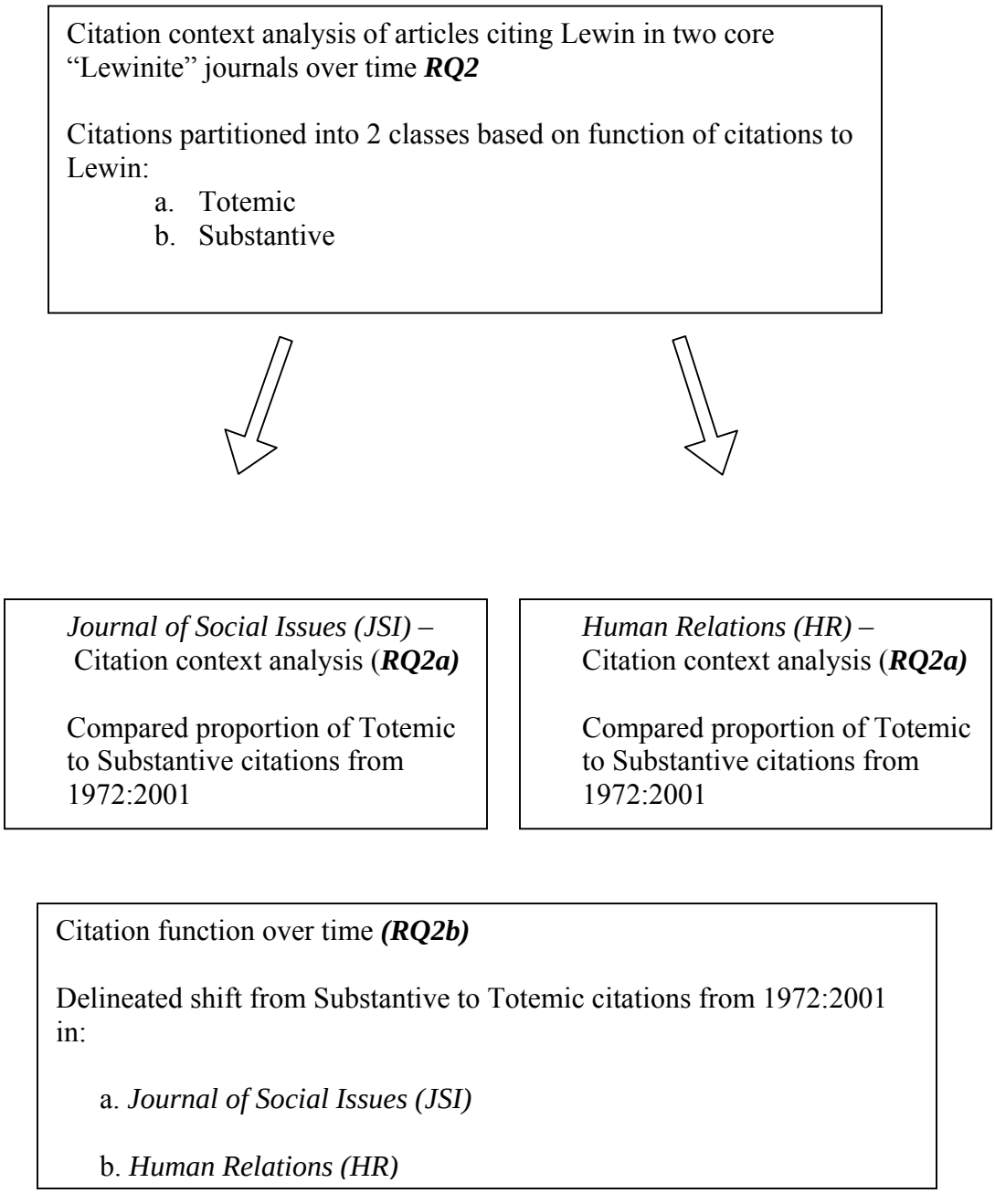


Figure 1. Schema of Research Questions and Methods *(continued)*

Concepts cited ***(RQ2c)***

Determined which of Lewin's concepts are cited in the *Journal of Social Issues* and *Human Relations*

RQ3. Clarification of Lewin's Role

RQ3 – Qualitative comparison of specified cocitation context analyses, analysis of citation function, and cited concepts with published accounts of Lewin's role in contemporary social science

Figure 1. Schema of Research Questions and Methods *(continued)*

III. REVIEW OF THE LITERATURE

This study buildt upon previous work conducted on research into patterns of communication among social scientists and two topics in bibliometrics—cocitation analysis and citation context analysis. This chapter summarizes key works on these topics that are germane to the research questions posed in the last chapter. Appendix E discusses the work of Kurt Lewin and his place in the development of social science.

III.1. Formal Communication in the Social Sciences

Researchers acknowledge the differences between major branches of scholarship[4] (natural science, social science, humanities) with regard to basic beliefs about the nature of knowledge, but have not widely studied how such differences lead to variation in communication (Meadows, 1998). Indeed, the definition and characteristics of a "discipline" are not generally agreed upon (Becher & Trowler, 2001; Meadows, 1998; Good, 2000). The developmental history of the three major divisions of scholarship and the rise of disciplines and research specialties is fraught with the consequences of politics, economics, and individual happenstance. The social sciences, particularly psychology, have witnessed the growth and decline of numerous specialties that mark their boundaries not only by the subject considered

[4] Numerous authors have refined this oft-repeated three-part division of scholarship into more subtle groupings that reflect the nature of knowledge growth, criteria for truth claims, etc.; however, reference to the tripartite division of knowledge is sufficient for the purposes of this study.

suitable for study but also by differences in practical approach and theoretical stance (Good, 2000).

The prominence given to theoretical and/or methodological orientation by social scientists cannot be underestimated.[5] Meadows (1998) points out examples where researchers' adherence to incompatible theories and/or methodologies led to the development of different journals and different professional associations. The importance of "orientation" in defining professional identity derives from a view such as the following. "Sociology does not discover what no one ever knew before, in this differing from the natural sciences. Rather, good social science produces a deeper understanding of things that people are pretty much aware of" (Becker 1982, cited in Becher & Trowler, 2001). Although sociology was the discipline mentioned in this quotation, the same may be generally said of the social sciences.

The importance of "orientation" as a component of professional identity is especially salient in the social sciences but scholars have likened all disciplines to "tribes" due to their "recognizable identities and particular cultural attributes" (Becher & Trowler, 2001; Campbell, 1979; Griffith & Mullins, 1972). One can argue that social science disciplines and specialties equate "orientation" with "tribal affiliation." Members of a scholarly discipline display their "orientation" or "tribal affiliation" in numerous ways, most markedly by the particular discourse that characterizes their group (Geertz, 1983). Meadow (1998) points out "if differences between subjects and disciplines are as meaningful as they seem, it is reasonable to suppose that they should be reflected in communication patterns." How, then, do

[5] This extends to the classification of a subject field, which is theory-laden, not neutral or ahistorical (Hjørland 1998).

specialties exhibit different communication patterns, particularly with regard to publishing their research?

Information science has considered the question of differences in communication patterns among areas of scholarship since the pioneering work of Price (1965, 1970). Price discovered that specialty groups differ in their use of previous literature, as evidenced by citations made in professional publications. He graphed networks of references and found that some journals contained an "overcitation" (greater than expected citation) of recent works. He termed this citation pattern the "immediacy effect" and formulated "Price's index" as a means of measuring it. Price claimed that "hard science" journals contained the highest percentage of citations to recent literature, the humanities had the lowest percentage, and the social sciences were in the middle. Price viewed these differences as related to how new information becomes absorbed into a specialty. The "hard sciences" more readily incorporate information, so that there is less need to refer to older literature. The social sciences are less codified, leading their authors to cite older works. Finally, humanities scholars frequently draw on older texts as the basis for their work and, therefore, are most likely to cite older works.[6]

Price's well-known study of the N-ray research literature was designed as an illustration of his ideas and was widely accepted for many years. Recent replication of the N-rays study determined, however, that much of the "overcitation" of recent work was due to self-citation and negative citation in a venue that often published

[6] He linked the frequent occurrence of recent citations with "progressive" or "cumulative" scholarship, which has the unfortunate evaluative connotation that all specialties should emulate the natural sciences rather than acknowledging and validating different models of "progress." For example, see the quote from Becher & Trowler on the previous page.

scientists' weekly updates of current projects (Baldi & Hargens, 1995). In a subsequent investigation of the referencing patterns in several other specialties, Baldi & Hargens (1997) found little support for some of Price's inferences, particularly regarding the social sciences. They concluded that there is a greater variety of reference network structures than formulated by Price.

Several researchers (discussed below) remarked on the relative importance social scientists attach to older works as observed in their citing patterns (Griffith & Small, 1983; Cozzens, 1985; Bazerman, 1988) Apparently, one way social scientists indicate their "orientation" or "tribal" affiliation is by citing the group's founders at a greater rate than do natural scientists or humanities scholars (Hargens, 2000). This research asked if combining this information with cocitation mapping increases understanding of a specialty's intellectual structure. The next section describes the literature from the topic of cocitation analysis most relevant to this research.

III.2. Cocitation Analysis

Cocitation analysis began with the conceptual work of Henry Small (1973). Using the document as the unit of analysis, Small and his colleagues conducted a number of studies that began with studies in the natural sciences and spread to include the social sciences. Small & Griffith (1974) established the basic technique for this methodology. A significant development in citation studies was the technical innovation of studying the author as the unit of analysis, pioneered by White (1981; White & Griffith, 1981a, 1981b). In author cocitation analysis, the cited author is the unit of analysis, representing the entire *oeuvre* or a subset of it. McCain's (1990)

technical paper provides a detailed exposition of the procedure. The third major innovation was journal cocitation studies introduced by McCain (1991a, 1991b), which uses the journal as the unit of analysis.

The concept of cocitation derives from the implicit linkages emerging when an author cites two bibliographic references (authors, documents, journals, etc.) in the same body of text. Although the author may not directly discuss the two items together, she/he considers both items relevant to the text. In this way, cocitation captures the citing author's mental model of a subject and judgment on the interrelationships of previous literature (White, 1990). A basic assumption of cocitation analysis is that frequently occurring pairs of citations indicate an intellectual relationship in the minds of a group of citing authors. A few instances of two citations appearing together are generally of little interest to cocitation analysts. The most frequently occurring pairs of citations indicate a consensus view of the cited items as expressed by the group of citing authors, generating a glimpse into the mental model of the citing group.

A hierarchical clustering of citations typically emerges from following cocitation protocols. The clusters can be examined at various levels of granularity because small clusters are connected to larger clusters an so on, up to the level of a view across science (Small, 1999). A very large body of research over the last thirty years proved the usefulness of this type of analysis for interpreting the intellectual structure of a discipline or specialty (See White & McCain, 1989, 1998; Cronin & Atkins, 2000; Borgman, 1990 for examples of the breadth of this methodology's application).

Current research into cocitation studies takes several directions. Cocitation analysts continue to apply the methodology to explore new subject domains, such as Morris (2001) with medical informatics and Scrimgeour (1999) with biblical studies. Howard White has consistently refined, expanded, and extended the application of cocitation analysis. Research such as White, Wellman & Nazer (2002), Sandstrom (2001, 1998), and Otte & Rousseau (2002) has delved into the relationship between formal and informal communication structures as interpreted by bibliometrics and social network analysis. Still another stream of research looks at ways to provide readily customized displays of structure for users (White, 2000; White, Lin & McCain, 1998; Buzydlowski, 2003). In extending this line of inquiry, White (2000) developed "ego-centered citation analysis," an extension of author cocitation analysis.

Ego-centered citation analysis consists of a set of techniques that permit the researcher to begin with a single author's name and, from there, to develop a four-faceted profile of the focal author's explicit intellectual relationships. White relates the networks of relationships documented from bibliographic sources to the ego-centered analysis of social network analysts. The four modes of analysis are the author's:

(1) ***Collaborators*** derived from seed author's coauthors

(2) ***Citation identity*** derived from the seed author's citees

(3) ***Citation image-makers*** derived from the seed author's citers

(4) ***Citation image*** derived from authors cocited with the seed author.

One limitation of standard cocitation maps is the "noise" that appears in citation–based information retrieval (Cronin, 1982). Experts are "often dismissive" of

clusters obtained from bibliometric maps because the maps do not reflect their own view of their subject (Meadows, 1998). Tijssen (1993) investigated the extent of congruence between fourteen experts' mental maps and bibliometric maps. In aligning the different maps, he found that difficulties emerged from several sources. An expert's mental map and his judgment of the bibliometric map depended on his own interests and background, and generally did not coincide very well with the bibliometric map. When Tijssen blurred the experts' and the bibliometric maps, he found the two were congruent in their general form but differed in the details. In a similar vein White (2003a) remarked that the goal of ACA is to provide a simplified picture. In doing so, however, some experts may object to details of the representation while generally agreeing that the overall representation is valid.

Previous research, however, demonstrated that employing knowledge elicitation techniques like card sorting does lead to experts' opinions coinciding with aggregate bibliometric maps (McCain, 1989; McCain, et al., 2003; Buzydlowski, 2003). Buzydlowski (2003), as discussed above, noted similar reactions from some experts about the lack of specificity in the cocitation maps. A challenge, therefore, in developing focused cocitation maps in the social sciences is to capture, as efficiently as possible, some aspects of the user's mental model or the "lens" through which the user views the specialty. Research suggests that this model might be associated with a "tribal patriarch."

This research used the citation image of a seed author, Kurt Lewin, as the basis for creating focused maps of intellectual structure. This issue arose when I began a study of Lewin's contemporary influence with the goal of deriving a

"Lewinian" perspective. It was obvious that the frequency of Lewin's citations meant that the usual cocitation data collection procedure would lead to a map of authors not clearly focused on Lewin—without a "Lewinian" perspective. Katherine McCain (personal communication, 1999) suggested the construction of a "filter" that would limit cocitation frequency counts to instances where Lewin appeared in reference lists along with his most highly cocited authors. The modification of the standard procedure meant that the analysis was, in effect, an author cocitation context analysis, corresponding to White's citation image.[7] The resulting study was published as "A tri-citation analysis of Kurt Lewin's citation image" (Marion, 2002). A goal of the present study was to explore possibilities for generating author cocitation maps that maintain the contextual perspective of social science journal communities, in this case, a "Lewinian" perspective. To that end, I extended the use of the ACCA technique to a set of citations in two journals published by two "Lewinian" specialties.

There is another aspect of citing behavior in the social sciences that had some potential for increasing interpretation of intellectual structure—the function citations serve in a scientific paper. The next section describes some significant research on this topic.

[7] Small (1974) first explored the concept of tri-citation as a "logical extension of co-citation." He was seeking a way to represent a frequently cited document in subject space. His solution was to construct "hills" and "circles" that distributed the documents around a central location.

III.3. Citation Context Analysis

"The choice of works cited reflects the citing author's perception of how the scientific community and its knowledge base are structured and previous contributions valued" (McCain & Turner, 1989, p. 127). Similarly, a citation's location in a document and the rhetorical function the citation serves are mediated by the author's personal choice and community conventions. A number of studies have elucidated the functions of citations in scientific literature, in hopes that understanding this behavior would lead to insights about the nature of scientific knowledge.

In contrast to cocitation analysis, which studies bibliographic references located at the end of a paper, this type of investigation characterizes the text containing a citation and classifies its rhetorical function. Small (1982) defined citation context as the "particular passage or statement within the citing document containing the reference" and citation context analysis as "any attempt to utilize these passages in a systematic fashion." He surveyed the ways in which researchers examined the functions of citations in texts and concluded that there are two separate but interrelated approaches to the analysis of citation function. The first approach, citation context analysis, "classifies the types or functions of references in scholarly texts." The second, citation content analysis, examines the "uses of the semantic content of the citing passage to characterize the citing work."

Several authors have extensively reviewed analyses of citation context (Small, 1982; Cronin, 1984; McCain & Turner, 1989; Liu, 1993), although the first three reviews discuss many of the same papers. Small reviewed eight classification

schemes used to analyze citations in the natural sciences, social sciences, and humanities. Despite the unique classification scheme developed by each researcher, Small found several similarities. One of these regularities was citations labeled variously as "historical," "perfunctory," "part of the relevant literature," "paying homage to pioneers," "ceremonial." This category contained significant portions of the citations in each study, ranging from twenty to sixty percent.

One of the studies Small reviewed was Cole's (1975) study of the impact of Merton's theory of social structure and anomie. Cole considered the high percentage of "ceremonial" citation to Merton (42%) as a way for citing authors to legitimate their own work. Several other articles reach a similar conclusion. Bazerman (1988), in comparing citations in a political science journal and a physics journal, concluded that the social science authors generally cited previous literature as a way of establishing the legitimacy and importance of their work rather than citing for specific results or methods. Noting that the citations to older works were found in the introductory sections of papers, Bazerman speculated that the social scientists need to "establish the literature" as a way of providing a rationale for their work. Cozzens (1985) also found that the social science specialty she studied was more likely to cite a foundation paper for its conceptual content rather than its results.

McCain & Turner (1989) conducted a study comparing citation history and contextual "importance" of eleven highly cited articles in molecular genetics. They were interested in ascertaining the general use authors made of these highly cited papers over time. The hypothesis was that perceived usefulness would be seen in: (1) the frequency of citations occurring in a citing paper, (2) the context of the citation,

and (3) the nature of the concept symbol as interpreted by researchers over time. Although their research examined a natural science topic, the methodology they developed was especially relevant for this study.

Their research attempted to focus on "certain fundamental aspects of information use by citing authors while making the categories as objective (and classification as replicable) as possible" (p. 134). McCain & Turner carefully constructed a codebook with examples of the types of articles they were investigating—research reports and reviews—and the categories of citation use—"central" and "peripheral." The results were consistent with previous research in concluding the importance of methods or technical papers. A methods paper is likely to be cited with the originator of the technique in subsequent research. Papers reporting specific research results, on the other hand, tended to be centrally important only immediately after their publication. Over time, the frequency of use declined in research reports and citations became more peripheral in review articles. A third type of citation consisted of papers that were fundamental theoretical contributions. This type of paper was cited approximately equally as central and peripheral categories but as single occurrences in the discussion section of articles.

Liu's (1993) review summarizes other citation context analyses that demonstrate how different disciplines or branches of science use citations differently (Hurt, 1985, 1987; Silverman, 1985; Cano, 1989). One classification scheme does not fit all but the different schemes do differentiate between citations that are important to the citing paper and citations that seem to contribute little to the paper. Hooten (1991) combined four classification schemes and found that more frequently cited articles

were more likely to be essential, concepts, or setting the stage. In contrast, infrequently cited documents were more likely to be casual or perfunctory. Further, frequently cited documents were used at a stable higher level over a longer period.

Few studies have compared citing behavior among the three major areas of scholarship—natural science, social science, and humanities. As discussed above, Price (1965), in his seminal work, inaugurated the scientific study of citations with an analysis of the N-ray specialty. In later papers, Price compared the reference network structure of different areas of scholarship, which he claimed natural sciences literature contains an overcitation of recent literature, social sciences have fewer such citations, and humanities still fewer to recent literature.

Quoting Griffith's (1988) observation that Price's work was not replicated for any natural science field, Baldi & Hargens (1997) attempted to replicate Price's N-rays study along with the reference networks for three additional specialties in the natural and social sciences (geography and sociology). They found that the social science specialties did not conform to Price's "conjectures." In fact, the sociology group had the pattern Price predicted for the humanities, which is an under-citation (occurring at a less than expected frequency) of recent works.

Hargens' (2000a, 2000b) interesting analysis of seven research specialties continued this line of research. He began by comparing reference networks to test Price's claims about the frequency with which recent or older papers are cited. Hargens found that the social science specialties differed from the other specialties in the frequency of citation to "foundational" papers. In fact, the social science specialties cited the "founding fathers" at a significantly greater rate than expected.

Additionally, the social science authors were more likely to include "orienting reference lists" in the introductory sections of their papers. Such lists included at least three documents cited for their general perspective or approach. Hargens next classified citations in the seven specialties according to whether the function of a paper's citation was: (1) an example, (2) a general point, or (3) a specific point. Finally, he examined the relationship between the age of the cited paper and citation for specific point. Results indicated that the social science specialties were more likely to include citations as an example or as a general point and the presence of citations for specific points did not increase the recency of references in their network.

The findings of these studies are congruent with the observation by Griffith & Small (1983) [quoted in Hargens, 2000a] that a few elderly "charismatic documents" are critical in the social sciences because of a lack of intellectual consensus. Griffith & Small found a widespread pattern of citing authority figures, referred to as "tribal patriarchs" in this study. Cozzens (1985) and Bazerman (1988) (above) likewise noted that social scientists cite previous work as indicators of general perspective or broad knowledge claims instead of citing previous work for specific results or techniques.

Other studies of citation context found somewhat different results. Peritz (1983) developed an eight-category classification scheme for social science and related areas. She differentiated between "setting the stage for the present study," "background information," and "historical" citations.

- *Setting the stage* referred to all the citations to previous work leading to the present study.
- *Background information* documents the basic data for the setting of the investigation (e.g. the populations studied) or justification for some methodological decision or background for some other study being compared to the present one.
- *Historical* acknowledges the work of pioneers or citations made while retracing the history of a subject. When the citation is truly tied to the research question at hand it should be placed in "setting the stage" regardless of its age.

Peritz found that 42% to 60% of the citations in the five journals she examined were categorized as "setting the stage" or "background information." "Historical" citations accounted for a very small percentage of the citations in two of the journals and none occurred in three journals. However, given that "acknowledging the work of pioneers" means that the citation is not "truly tied to the research question," perhaps the paucity of citations in this category should not be surprising.

The meaning of citations is not static. Small (1978) analyzed the citation usage of the most highly cited documents in chemistry and found several characteristics. First, these papers were older than less frequently cited papers. Second, the highly cited papers were often cocited with several other papers from the same group. Third, the citations in this group tended to be methods or technique papers. Fourth, the citations acquired a standardized meaning symbolizing a concept.

Small thus asserted that citations are concept symbols and suggested the utility of tracing the development of a work into a standardized concept symbol.

Cozzens (1985) compared citations for two papers, one in the sociology of science and the other in neuropharmacology. She found that, over time, the sociology paper was cited primarily for its general conceptual content and not for its results, a different outcome than for the other paper. Further, over time the neuropharmacology paper acquired a standard citation of the main knowledge claim, which did not happen in the sociology paper.

Given Lewin's role in social science as a "tribal patriarch," it was important to establish whether over time authors cite Lewin primarily for specifics of his work, as an orienting figure, or a combination of both in "Lewinite" journals, such as the *Journal of Social Issues* and *Human Relations*.

III.4. Significance of the Study

The possible value of this research extends in several directions, which include:

- Provide a basis for extending the ability of cocitation mapping to offer focused analyses in the social sciences.
- Clarify the relationship between the function of citations and cocitation analysis.
- Offer a fresh appraisal of Kurt Lewin's influence in the social sciences—a form of domain analysis.

IV. RESEARCH DESIGN

IV.1. Introduction

This chapter reviews the steps taken execute the study. The data sources are profiled, methods of data collection are described, and the techniques used for data analysis are outlined. The following two chapters present the results from executing the research design.

IV.2. Unit of Analysis

The unit of analysis chosen for this research was the names of authors found in the reference lists of selected articles in two journals indexed by the Institute for Scientific Information. The next section describes the rationale for choosing these two journals. The cocitation context analysis used the names of authors cocited with Lewin. The analysis of citation function used the textual reference to Lewin in the same set of documents.

Journals

As discussed in the introductory section of this report, Lewin is an important figure in the social sciences although there is a range of opinions about the extent and significance of his contributions in present day science. Lewin's role as a "founder" of several research specialties made his work an ideal focus for exploring techniques that refine author cocitation mapping. Analysis of the literature from key "Lewinite" journals provided a test bed for exploring the research questions.

I chose two journals, *Journal of Social Issues (JSI)* and *Human Relations (HR)* that are influential and share historical and contemporary links to Lewin (discussed below). Ranking cited authors for the *JSI* and *HR* for 1972-2001 in the *Social Sciences Citation Index (SSCI)* finds Lewin close to the top of the list for each journal (third for the *JSI* with 75 citations and twelfth for *HR* with 122 citations). In contrast, the *Journal of Personality and Social Psychology* has a higher raw citation count to Lewin but Lewin does not rank among the top citees for the journal, suggesting Lewin is less influential in that journal. The journals chosen are also prominent in a ranked list of journals citing Lewin in the three databases produced by the Institute for Scientific Information (*Social Science Citation Index [SSCI], Science Citation Index [SCI*], and *Arts & Humanities Citation Index [A&HCI])*. Below is a profile of the two journals used in this study.

Journal of Social Issues

Lewin is highly cited is the *Journal of Social Issues (JSI)*, which is published by The Society for the Psychological Study of Social Issues (SPSSI), Division 9 of the American Psychological Association. Although psychologists constitute a majority of SPSSI members, membership is open to anyone and includes sociologists, anthropologists, and political scientists among others. The goal of the *JSI* is to apply Lewin's dictum, "There is nothing as practical as a good theory," to the amelioration of social problems using rigorous scientific means. This statement of Lewin's is prominently displayed on the Society's website. In the preface to an issue titled, "The Heritage of Kurt Lewin," the editor, Stuart Oskamp remarks, "Kurt Lewin is our

George Washington. That is to say that he was a central figure in setting social psychology on its present course, and his influence was and is pervasive in the philosophy and work of SPSSI" (1992, p.2.). The *Social Science Citation Index's* ranking of the *JSI* sixth of 31 social issue journals and eighth of 26 social psychology journals in terms of citation impact in 2000 demonstrates this journal's influential status.

Lewin was a founder of SPSSI and *JSI*, and served as SPSSI president. SPSSI bestows the Kurt Lewin Award annually to an individual who exemplifies Lewin's commitment to social justice and practical application of research. Social SciSearch (Dialog File 7) ranks Lewin the third most highly cited author for the *JSI* between 1972 and 2001. A number of Lewin's most prominent students and colleagues are also highly ranked authors. *JSI* was the most highly ranked journal in which the term "Lewinian" appears, according to a search in the Dialog OneSearch databases (discussed previously).

Human Relations

The Tavistock Institute in London has published *Human Relations (HR*) since 1947. The Tavistock Institute originally published *HR* in conjunction with the Institute for Social Research at the University of Michigan, where Lewin's students moved after his death. The first issue of *HR* was dedicated to Kurt Lewin, who died shortly before its publication. The first issue of *HR* also includes one of Lewin's most highly cited papers (published in two parts)—"Frontiers in group dynamics: I. Concept, method and reality in social science; Social equilibria and social change"

and Frontiers in group dynamics: II. Channels of group life; Social planning and action research."

Tavistock Institute's mission is groundbreaking research in group relations, organizational theory, and participative planning and evaluation. *HR* is described as a "pioneering publication for multidisciplinary and action research … playing a role as a bridge between specialized sociological and psychological publications on the one hand and the more applied vocational and managerial periodicals on the other" (Sage Publications web site). ISI classifies *HR* as a management journal. Among its most highly cited authors are prominent management figures, such Schein, Argyris, and Mintzberg. *HR* was second in the ranking of journals containing the term "Lewinian," which is not surprising given that *HR* has been specifically identified as continuing the Lewinian legacy (Graumann, 2002).

Despite sharing links to Lewin, the *JSI* and *HR* focus on two different research agendas as seen in Table 1, which shows the sixty most highly cited authors for each journal (*SSCI* from 1972 to 2001). Only nine of the sixty top cited authors besides Lewin (with names in bold) are present on both lists. Several of Lewin's students (Festinger, Deutsch, and French) are among the nine along with canonical figures Freud and Merton. Overall, the two author lists differ in that the *JSI* authors write about social psychology and group dynamics and the *HR* authors write about organization culture and management. These two author groups roughly correspond to two similar authors clusters in the pilot study.

Table 1. Ranked Authors in *JSI & HR*

RANK	JSI Authors	HR Authors
1	**DEUTSCH M**	ARGYRIS C
2	ALLPORT GW	HACKMAN JR
3	**LEWIN K**	PFEFFER J
4	TAJFEL H	THOMPSON JD
5	**BANDURA A**	WEICK KE
6	BREWER MB	**KATZ D**
7	**FESTINGER L**	MINTZBERG H
8	FISKE ST	PORTER LW
9	**GOFFMAN E**	SCHEIN EH
10	ROKEACH M	KANTER RM
11	PETTIGREW TF	LAWLER EE
12	TAYLOR SE	**LEWIN K**
13	**CAMPBELL DT**	MARCH JG
14	PIAGET J	EMERY FE
15	KELMAN HC	LOCKE EA
16	JONES EE	WEBER M
17	SEARS DO	LAWRENCE PR
18	BERKOWITZ L	PERROW C
19	EAGLY AH	VROOM VH
20	LERNER MJ	**GOFFMAN E**
21	SHERIF M	BURNS T
22	US BUR CENS	STEERS RM
23	**KATZ D**	TRIST EL
24	BROVERMAN IK	**FESTINGER L**
25	JANIS IL	CHILD J
26	KELLEY HH	LIKERT R
27	MILGRAM S	BLAU PM
28	ADORNO TW	COHEN J
29	LAZARUS RS	ETZIONI A
30	BRONFENBRENNER	MORGAN G
31	**FREUD S**	MOWDAY RT
32	COHEN S	**FRENCH JRP**
33	KOHLBERG L	BION WR
34	HEIDER F	**FREUD S**
35	SMITH MB	STAW BM
36	DARLEY JM	VANMAANEN J
37	GERGEN KJ	HERZBERG F
38	LANGER EJ	HOUSE RJ
39	PRUITT DG	SALANCIK GR
40	WALSTER E	KAHN RL
41	RODIN J	BERGER PL
42	WORTMAN CB	SIMON HA
43	BEM SL	RICE AK
44	ERIKSON EH	WALTON RE
45	**FRENCH JRP**	PARSONS T
46	SCHUMAN H	BENNIS WG

Table 1. Ranked Authors in *JSI & HR (continued)*

47	SCHWARTZ SH	WOODWARD J
48	KANTER RM	**BANDURA A**
49	**MERTON RK**	GOULDNER AW
50	STEPHAN WG	**MERTON RK**
51	WHITE RK	MCCLELLAND DC
52	AM PSYCH ASS	BASS BM
53	COOK SW	ROTTER JB
54	CROSBY F	**CAMPBELL DT**
55	MACCOBY EE	**DEUTSCH M**
56	TETLOCK PE	HOFSTEDE G
57	ARONSON E	HOMANS GC
58	BRICKMAN P	PETTIGREW AM
59	DEAUX K	BRIEF AP
60	KATZ I	GIDDENS A

A ranked list of the 60 authors most highly cocited with Lewin from 1972 to 2001 appears in Table 2. Ten of the 60 authors cocited with Lewin are placed on both lists (names in bold). Several of the authors on both lists are Lewin's students: Deutsch, Cartwright, French, Festinger, and Lippitt. Other students and colleagues of Lewin, such as Marrow (*JSI*), Likert (*HR*), Trist (*HR*), Blake (*HR*), and Cook (*JSI*), appear on one of the lists (journal indicated in parentheses). As in Table 1 (above), many of the authors from *JSI* appear in the Social Psychology cluster in the pilot study and the *HR* authors appear in the Organization and Management clusters. Thus, even though authors writing in both journals find Lewin and some of his students relevant, most of the most highly cited authors comprise two different groups, again approximating two clusters in the pilot study. The two lists of 60 authors from Table 2 formed the author name sets for the author cocitation context analysis.

Table 2. Ranked Authors Cocited with Lewin

RANK	JSI Authors	HR Authors
1	**DEUTSCH M**	ARGYRIS C
2	**CARTWRIGHT D**	WEICK KE
3	**FESTINGER L**	HACKMAN JR
4	TAJFEL H	TRIST EL
5	ALLPORT GW	BENNIS WG
6	MARROW AJ	LIKERT R
7	**LIPPITT R**	EMERY FE
8	**FRENCH JRP**	**FRENCH JRP**
9	SHERIF M	**KATZ D**
10	**CAMPBELL DT**	HOUSE RJ
11	**KATZ D**	LAWLER EE
12	BERKOWITZ L	VROOM VH
13	JANIS IL	**FESTINGER L**
14	KELMAN HC	SCHEIN EH
15	LEWIN M	BION WR
16	MOSCOVICI S	COHEN J
17	RAVEN BH	MINTZBERG H
18	ROKEACH M	PORTER LW
19	WHITE RK	RICE AK
20	ZANDER A	ACKOFF RL
21	**BANDURA A**	MARCH JG
22	BARKER RG	MCCLELLAND
23	JAHODA M	**CAMPBELL DT**
24	JONES EE	COCH L
25	KELLEY HH	**LIPPITT R**
26	MILGRAM S	MASLOW AH
27	PETTIGREW TF	THOMPSON JD
28	PIAGET J	WALTON RE
29	AMIR Y	BLAKE RR
30	ARONSON E	BURNS T
31	BREWER MB	**DEUTSCH M**
32	BRONFENBRENNER	**KANTER RM**
33	BYRNE D	LOCKE EA
34	FINE M	PFEFFER J
35	FISKE ST	SIMON HA
36	GRAEBNER W	WHYTE WF
37	HARRIS B	ASHBY WR
38	KIPNIS D	HERBST PG
39	**MCGRATH JE**	JAMES LR
40	MURPHY G	JANIS IL
41	NEWCOMB TM	LAWRENCE PR
42	APFELBAUM E	MORGAN G
43	ASCH SE	PERROW C

Table 2. Ranked Authors Cocited with Lewin *(continued)*

44	BARGAL D	PETTIGREW AM
45	CAPLAN N	SCHNEIDER B
46	CAPSHEW JH	ALDERFER CP
47	CHEIN I	**BANDURA A**
48	COCH L	BECKHARD R
49	COOK SW	**CARTWRIGHT D**
50	DERIVERA J	FIEDLER FE
51	DOLLARD J	FREUD S
52	FINISON LJ	GOFFMAN E
53	GAMSON WA	HEDBERG B
54	HOFFMAN ML	HERZBERG F
55	HOVLAND CI	KUHN TS
56	**KANTER RM**	LEAVITT HJ
57	KOHLBERG L	**MCGRATH JE**
58	LANGER EJ	MILLER EJ
59	MERTON RK	MURRAY HA
60	SAMELSON F	PUGH DS

One goal of this study was to explore the intellectual structure of the two journal communities. Reference lists that cite Lewin in the "Lewinite" publications, *Journal of Social Issues* and *Human Relations* were, therefore, the test bed for this project. The data set was a particularly rich one: (1) *JSI* and *HR* are central to Lewin's citation image and likewise Lewin is a central figure for the groups sponsoring the journals; and, (2) only articles that cite Lewin in these journals form the data set. My assumption was that exploring partial *oeuvres* in these key journals provided a basis for examining contextually derived analyses of intellectual structure.

IV.3. Data Source

Database

The source of data for this study was the Social SciSearch database, an international, multidisciplinary index to the literature of the social, behavioral, and related sciences, produced by the Institute for Scientific Information (ISI), which is available on Dialog. Social SciSearch contains all of the records published in its print counterpart, the *Social Sciences Citation Index*. Social SciSearch indexes items (articles, reports of meetings, letters, editorials, correction notices, etc.) from the more than 1,500 social sciences journals worldwide 1972 to the present. Social SciSearch indexes both *JSI* and *HR* over the period covered in this study.

Time Frame

Although the pilot study partitioned citations into two fifteen-year segments in order to capture changes in Lewin's citation image over time, the smaller data sets available from two journals necessitated that the time frame for each journal remained unpartitioned. Data were collected for the same thirty-year span as the pilot study—1972 through 2001. This period was enough time for several generations of scholars to use Lewin's work.

IV.4. Data Collection for Author Cocitation Context Analysis

The basic framework for data collection followed the procedures for cocitation analysis outlined in McCain (1990) and for generation of an author citation image described by White (2001). The variation in procedure that produced the

cocitation context analysis is reported in Marion (2002) that is attached to this proposal (Appendix A). Two important points are noted below.

1. Data were collected only for articles appearing in *JSI* and *HR* that had citations to Lewin. These data were particularly rich sub-sets, that is, articles that cited Lewin in two "Lewinite" journals.
2. Unlike the pilot study, which collected data from the three ISI databases, data for the micro-level analyses were collected only in Social SciSearch, which indexes both *JSI* and *HR*.

IV.5. Analysis of the Author Cocitation Context Data

I used three multivariate techniques to identify intellectual structure in the cocitation data. These procedures—cluster analysis, multidimensional scaling, and principal components analysis—are typically used in cocitation analysis to explore the underlying structure of the data. The procedures comprise a suite of "methods that bring 'order' to the data in the form of structure among the observations or variables. In this way, the researcher can better understand the basic structures of the data, not only facilitating the description of the data, but also providing a foundation for a more refined analysis of the dependent relationships" (Hair, et al., 1998, p.468). Additional analysis was obtained from use of the Pathfinder Network program, a more recent addition to the bibliometric toolkit. As with all research methods, each of these has its strengths and weaknesses. Each method also offers different information, which is why it is important to use several methods to gain different perspectives of the data.

Cluster Analysis

Cluster analysis can be used for several purposes, including exploratory data analysis, comprehending the data more clearly, and subsequent analysis (Kruskal, 1977). This method is useful for defining groups of objects with maximum homogeneity within the groups while also having maximum heterogeneity between the groups (Hair, et al., 1998). In other words, the goal is to define the most similar groups that are also the most different from each other. Cluster analysis is comparable to factor analysis (discussed below) in its goal of assessing structure. It differs from factor analysis in that with cluster analysis one item (cited author names in this study) can only belong to one cluster and the degree of similarity between cited authors is not described (McCain, 1990). In factor analysis, however, every item has a loading on every factor.

The weakness of cluster analysis is that its strength is in exploring data; it has no statistical basis from which to draw inferences. The procedure will always create clusters and the clusters will very according to the procedural elements chosen. The researcher selects the final cluster solution on his/her judgment of the solution leading to the best classification of items. The cluster solution is improved by restricting the number of clusters according to conceptual aspects of the problem (Hair, et al., 1998). Cluster analysis allows the researcher to identify which units of analysis, i.e. authors in this study, have similar profiles according to those who cite them.

Cluster analysis consists of a family of statistical techniques that classify variables into groups based on a similarity measure (Aldenderfer & Blashfield, 1984). In cocitation analysis Pearson's *r* correlation coefficient is generally used to assemble

a proximity matrix from the raw cocitation frequency counts. The algorithm frequently chosen for cocitation analysis is agglomerative hierarchical clustering. In this procedure, clusters form by initially placing each object in a separate cluster. In each subsequent step, the two objects that are most similar are combined to build a new cluster. The procedure continues grouping cases into bigger and bigger clusters until all cases are members of a single cluster (Norusis 1997). The representation of this process is a dendrogram or tree graph.

Authors have used several agglomerative clustering methods in bibliometric studies. According to McCain (1999), cited in Morris (2001), Single Linkage, Complete Linkage, and Ward's Method have proved useful but Complete Linkage is less sensitive to violations of the assumption of non-zero values in the diagonal and is widely used in current studies. Complete Linkage, also referred to as the "farthest-neighbor" approach, links all objects in a cluster at some maximum distance or by maximum similarity. The pilot study used Complete Linkage. In this research, I employed the Complete Linkage option of hierarchical agglomeration available in the SPSS clustering program (Advanced Statistics 8.0).

Multidimensional Scaling

Multidimensional scaling (MDS) refers to several techniques that help to identify key dimensions from a series of similarity measurements. MDS can help determine (1) the dimensions to use in evaluating objects; (2) how many dimensions to use; (3) the relative importance of each dimension; and (4) how the objects are related perceptually (Hair, et al., 1998). MDS does not require the researcher to

specify the attributes of comparison but only to specify the objects (author names here) and make sure the objects share a common basis for comparison (the cocitation proximity matrix here). MDS can be compared to factor analysis and cluster analysis. Factor analysis groups variables into variates that define underlying dimensions in the original set of variables. Variables that highly correlate are grouped together. Cluster analysis groups observations according to their profile on a set of variables so that observations in close proximity to each other are grouped together.

Kruskal (1977) discussed several differences between cluster analysis and MDS, noting that although both methods may result in accurate representations of the data, they do not provide the same information about the data. One difference is that MDS gives meaning about large dissimilarities in the data while cluster analysis gives information contained in small dissimilarities. The consequence of this is that MDS is most useful in depicting the general position of points because small changes in the data can cause the position of individual points to shift, sometimes quite a bit. Cluster analysis, on the other hand, tends to afford the most meaningful perspective on the small clusters formed early in the process while large clusters generally offer less meaningful information. Kruskal recommends one way to use the complementary information supplied by both methods is to draw loops corresponding to clusters around the MDS points.

One crucial difference between cluster analysis and MDS lies in their visual representations. Cluster analysis produces a tree structure—the dendrogram. MDS produces a visual display or map, in which similarity of authors' cocitation patterns are represented by spatial proximity on the map. This map has opposite levels of

dimensions on the ends of the X- and Y-axes. Each object is placed on the map that reflects the relative similarity to other objects with regard to the dimensions of the map. Objects with a high degree of similarity to other objects are placed closer together on the map. Conversely, objects that highly dissimilar to others are placed further apart on the map. Objects that are highly related to many other objects are located close to the center of the map, while those with little relationship to other objects are found on the periphery (Coxon, 1982). Again, the researcher's judgment is crucial to interpreting the underlying dimensions of the data. Generally this requires someone familiar with the subject under study who can supply the content knowledge.

The number of dimensions represented in the data is determined by several approaches: subjective evaluation, scree plots of the stress measures, or an overall index of fit. Two measures of fit are used to determine the best solution—R square value (RSQ) and Kruskal's Stress index. RSQ indicates the percentage of variance in the proximities matrix that has been captured in a solution. Stress signifies the degree that a solution is distorting the original data within the chosen dimensional solution (Coxon, 1982). An RSQ value of .8 or higher with stress of less than .2 obtained in two or three dimensions indicate a desirable solution. One caveat is that the RSQ will increase with additional dimensions.

A two-dimensional map is most commonly reported in the literature and is generally the most easily interpreted; however, a three-dimensional solution must be considered when it adds significantly to the map's interpretability (McCain, 1990). In the pilot study, a three-dimensional solution was optimal but only the first two

dimensions were depicted because of the difficulty in visualizing an easily understood three-dimensional map. The first dimension, or X-axis, explains the most variance. The second or Y-axis is orthogonal to the first axis and explains most of the remaining variance. A common pattern in cocitation studies is to find the X-axis depicts an array of subjects and the Y-axis shows various methodologies (McCain, 1990).

Principal Components Analysis (PCA)

This third multivariate procedure produces yet another perspective on the proximity matrix assembled from the cocitation data. Principal components analysis, a form of factor analysis, identifies a small number of underlying, not directly observable, constructs that can represent relationships among sets of many interrelated variables. In using PCA the researcher can first identify the dimensions of the structure and then determine the extent to which each variable is explained by each dimension. Like the previous two methods discussed above, PCA is an interdependence technique in which all the all variables are simultaneously considered and each related to all others. Hair, et al. (1998) cautions that like the other two methods discussed above, PCA the analysis depends on researcher interpretation and therefore, should be used in conjunction with other methods to provide additional perspectives of the data. White (2003a) advocates using factor loadings to capture subject specialties by considering authors loading above a threshold as contributors to a specialty.

A good factor solution is both simple and interpretable, with as few factors as possible explaining the observed correlations. The component factor model is most appropriate when the concern is to identify the minimum number of factors necessary to account for the maximum amount of variance. Factors are composed of unique and common variance with the proportion of unique variance higher in earlier factors. The scree test identifies the optimum number of components that can be extracted before the amount of common variance begins to dominate the unique variance structure. A scree plot displays the total variance associated with each factor. The graph plots the eigenvalues (the sum of the squared loadings on the factor) of the data. The plot initially slopes steeply downward and then gradually becomes a horizontal line. The most important factors are located on the steep slope of the scree plot. The point at which the line begins to straighten out is the optimal number of factors to extract (Norussis, 1997).

Hair, et al. (1998) note that interpreting the components and selecting the final component solution involves several steps. The initial unrotated factor solution computes a preliminary number of factors to be extracted. The first factor extracted is the single best summary of linear relationships in the data. The second factor extracted contains the variance remaining after the first factor has been extracted. Subsequent extracted factors are defined in a similar fashion until all the variance is exhausted. Factor rotation is a tool that aids interpretation of the factors by turning the axes of the factors until another position is reached. Rotating the factor matrix redistributes the variance from early factors to later ones in order to achieve a simpler and presumably, more meaningful factor pattern. In an orthogonal rotation, the axes

are maintained at 90 degrees. When not constrained to maintain the 90 degrees, the rotation procedure is called an oblique rotation.

The default setting in SPSS is the orthogonal rotation using the VARIMAX method, which tends to produce a matrix in which some loadings are high (closer to +1 or –1) an other loadings are low (closer to 0). This leads to a simpler matrix that indicates a clear positive or negative association or a lack of association (Hair, et al., 1998). Oblique rotation methods allow correlated factors instead of maintaining independence between them. SPSS provides the OBLIMIN option in its package to conduct this analysis. Hair, et al. (1998, pp.110-111) point out that the choice of rotation method should be made on the basis of the research needs. If the goal is to obtain several theoretically meaningful factors, an oblique rotation is appropriate because realistically very few factors are uncorrelated as in an orthogonal rotation.

The factor structure matrix is especially useful in cocitation studies (McCain quoting Griffith, personal communication, 2003). The factor structure matrix, which reports the correlation of variables to factors, contains the coefficients, termed factor loadings, used to express a standardized variable in terms of the factors. In cases where oblique rotation (OBLIMIN) is used, the factor loadings and the factor variable correlations are no longer identical (Gorsuch, 1983).

Observed correlations between variables result from sharing these factors; therefore, a variable can load on one than one construct (Gorsuch, 1983). This method is especially useful in a cocitation study for showing the breadth of an author's eminence. An author may display a "crystallized" image by loading on a single factor or a "diffuse" or "pervasive" image by loading on several factors (White, 2000).

Summary

The three multivariate procedures used in this study provide complementary perspectives on similarity data and for that reason are regularly used together in cocitation analysis. Cluster analysis is especially useful for classifying author names (in this study) and depicting small differences between groups of authors; however, since each author can only belong to one cluster, additional information about multiple relationships is not available. The visual representation of cluster analysis is a tree structure called a dendrogram, which enables the researcher to easily see which authors have similar cocitation profiles. Multidimensional scaling is particularly valuable for modeling the structure and dimensions and displaying large dissimilarities in data. The visual representation of MDS is a map or configuration of data points in low dimension space that enables the researcher to see and interpret underlying dimensions in the data and to see the relative position of each data point *vis a vis* each other. Principal components analysis is a data reduction method that seeks to find a minimum number of underlying constructs that can represent relationships among sets of many interrelated variables. This method is useful for showing an author's eminence and the degree to which an author contributes to a factor because authors will have a loading on each factor.

Pathfinder Network Analysis

Pathfinder Network (PFNet) is a modeling program for associative networks based on proximity data that uses a minimum spanning tree (linking a variable's largest shared value) to create a network diagram (Schvaneveldt 1990). When the program is employed in author cocitation studies the author names become nodes in a graph. Lines that represent weights (computed from the cocitation counts by the Pathfinder algorithm) connect the nodes. In a recent article, White states "PFNets can, and should, be generated from matrices of raw counts rather than Pearson correlations, which removes a computational step associated with traditional ACA" (2003a, p. 423). He demonstrates the relative ease with which quite informative displays can be created. Because the network representation is generated from raw cocitation counts rather than profile similarities generated from correlations the PFNet depicts different relationships among author names than those gleaned from the methods described above. For example, the name with the largest number of citations—dominant authors—will appear in the center of a star-like formation with other names around the center. Marginal names in the data set will be placed on the periphery of the network, most likely connected to just one other name. Other names will connect different groups of authors, acting as "gatekeepers" that link different subjects.

When the parameters are set to r = infinity (the metric used to compute the distance of a path between nodes) and q = n – 1 (the number of authors minus one) the network appears as a skeletal structure showing only the most substantial links between nodes (authors in this study). This tool, added somewhat recently to the

armentarium of cocitation analysts, has proved to be useful in depicting relationships between objects. White used PFNets in several studies of "ego-centered" author cocitation analysis (ACA). Marion & McCain (2001) contains an example using journals as the unit of analysis. In this study, PFNets are generated from raw cocitation counts for the authors cocited with Lewin in two journals.

IV.6. Data Collection for Analysis of Citation Function

The data set for the citation context analysis was based on the same set of articles from *JSI* and *HR* as the author cocitation context analysis. Data consisted of citations to Lewin in articles published between 1972 and 2001 in *JSI* and *HR* that are coded according to their context in the citing article. I also collected data on additional characteristics of the citations, such as the publication date of the citing article, and the work cited.

Coders

Two coders with subject expertise independently performed the coding. I was one of the coders and the other was a psychologist with considerable experience in psychology, management consulting, and familiarity with Lewin's work.

IV.7. Analysis of Citation Function Data

Articles in the *Journal of Social Issues* and *Human Relations* were classed into categories based on the McCain & Turner (1989) definitions for a research report and a review. A third category, Theoretical/Conceptual, was added because it represented a significant type of article found in the journals under study. Citations to

Lewin are assigned to one of two classes—totemic or substantive. Descriptions of the categories and classes follow as well as examples of each.

Citation Context Classification Scheme

A. Categories of articles

The journal articles consisted of three types: (1) Research Report; (2) Review, historical or state-of-the-art; and (3) Theoretical/Conceptual. These categories were defined as follows.

(1) Research Report – a scientific paper describing original research results, often divided into formulaic sections, such as introduction, methods, results, and discussion (McCain & Turner, 1989).

(2) Review – both informative and tutorial, intended to provide a general orientation and bring the reader "up to speed" in some specific research area by describing the background, the previous consensus, selected recent research, and current controversies (McCain & Turner, 1989).

(3) Theoretical/Conceptual – combines elements of a research report and a review by presenting a new formulation or framework for viewing a problem, which may include an introduction, previous research and theoretical / conceptual positions, and claims for validity.

B. Classes of citations

Citations were assigned to one of the following classes: (1) Totemic, (2) Substantive. Definitions of these categories are below. Assignment of a citation to a class was based on the coder's assessment that the bulk of a citation's characteristics corresponded more closely to one category rather than another. A citation, therefore, did not need to satisfy all the criteria to be assigned to a category. Below are lists of the characteristics for Totemic and Substantive citations followed by examples taken from a sample of articles in *JSI* and *HR* that formed the codebook for the complete analysis.

Totemic

- Orients the reader to the author's general approach or theme without describing specifics of the cited work
- Located in introduction or discussion sections
- An example or an acknowledgement that other work in the same general area was done, sometimes indicated as (e.g., Lewin, 1946)
- Often the only citation to the focal author in the paper
- Identified by the coder as a concept symbol or standard symbol

Substantive

- Directly related to the context of the present paper
- Identified for specific methods or results
- Located in data, methods, or results

- Often one of several citations to the focal author in the paper

Review article

Totemic:

Lewin is identified with a concept, such as "action research," "life space," or "group process," without describing specific results or methods.

Example – "Action research (e.g., Lewin, 1946) is particularly useful for studying such migrations across the divide between 'ordinary' and 'expert' knowledge in social movements …" [Article contains no other references to Lewin.]

Example – "This is akin to what Lewin (1948) proposed as a life space." [Article contains no other references to Lewin.]

Example – "In the aftermath of the Second World War, Kurt Lewin (1948) studied group processes." [Article contains no other references to Lewin.]

Substantive:

Lewin's work provides a framework for understanding the current work.

Example – "The history and background of the analysis of the basis of power is examined, beginning with its origin in the works of Kurt Lewin and his followers at

the Research Center for Group Dynamics." [Article includes multiple references to Lewin's works as the basis for present research.]

Example – "The Lewinian Concept of Democracy" [Major section heading followed by detailed description of the concept with additional references to Lewin's work].

Research Report

Totemic:

Lewin is cited as a concept symbol.

Example – "It [referring to another study] was also an example of action research (Lewin, 1946) insofar as reports of the data were presented to a portion of the community in user-friendly form as an impetus for their interpretation and action planning." [Article contains only one reference to Lewin, located in the Discussion section.]

Substantive:

Lewin's work provides the framework for the research.

Example – "We view these in terms of a psychological field (Lewin, 1935, 1948; Pratkanis & Turner, 1993) in which an individual with needs, perceptions, and beliefs is placed in a social situation with certain norms, barriers, and social forces." [Article contains additional references to Lewin's work.]

Theory/Conceptual paper

Totemic:

Lewin is cited as one of several references to previous work on a problem.

Example – "These include cognitive rigidity (Lewin, 1936), neuroticism (O'Connor, 1951), excessive attention seeking (Zeaman & House, 1963), and dissociation between verbal and motor systems (Luria, 1963)." [Although the citation refers to a specific finding, the citation's context is one example of previous work. Article contains no other references to Lewin.]

Example – Psychologists have long advocated the use of participatory, action-oriented research methods (Lewin, 1948; Miller, 1969; Wandersman, Chavis, & Stucky, 1983), but as Chavis, Stucky, and Wandersman (1983) point out, the science of psychology has yet to fulfill its potential in accomplishing this goal." [Although the citation refers to a specific finding, the context is that the citation is one example of previous work. Article contains no other references to Lewin.]

Substantive:

Author identifies his work with Lewin.

Example – "Lewin did say there was nothing as practical as sound theory. He defined the properties of sound theory. I will make some of these properties explicit and illustrate their implications for scholarly consulting." [Article contains additional, specific references to Lewin's work.]

Example – "Those who are only familiar with recent works on the bases of power may not be aware of the extent to which our work was stimulated by the many insights of Kurt Lewin. [Author goes on to give five specific references to Lewin's contributions.]

Citation function over time

In order to determine whether citation function changes over time, the citations to Lewin were charted in two graphs (one for each journal), which indicated the citations occurring in five-year segments. The total number of citations to Lewin totaled more than the number of articles because more than one citation can occur in an article. A paper could also include substantive and totemic citations.

Concepts cited

Each of the two coders read the passage surrounding each citation to Lewin and recorded the concept being cited. Data were also collected on the works cited.

Summary

This chapter describes the specific steps taken to execute the study and outlines the procedures used to analyze the data. The next two chapters report the results of executing the research design. Chapter V describes the results for *JSI*. Chapter VI reports the results for *HR*.

V. LEWINIAN INTELLECTUAL STRUCTURE IN THE *JOURNAL OF SOCIAL ISSUES*

V.1. Introduction

This chapter presents the results of the data collection and analyses of an author cocitation context analysis (ACCA) and citation context analysis of articles citing Lewin in the *Journal of Social Issues.* I briefly review the procedures used to arrive at an acceptable solution for mapping the intellectual structure of this small but focused data set. Next I discuss the groups created by the cluster analysis, the dimensions of the MDS map, the results of the principal components analysis, and the Pathfinder network analysis. After presenting the results of the author cocitation context analysis, I report the results of the citation context analysis.

I arrived at an interpretation of intellectual structure using ACCA in a two-step mapping process (described below). The first solution is derived from data collected on the top sixty authors cocited with Lewin in the *JSI* between 1972 and 2001. The results, especially the MDS map, portray two very different foci for authors cocited with Lewin. One focus is derived from historical appraisals of Lewin's contributions and from anniversary issues of the journal and represents particularly local interests for that journal. The other focus is derived from many authors cocited with Lewin in the pilot study; that is, mostly prominent psychologists who wrote about experimental social psychology, group dynamics, etc. The former author group, although highly cited with Lewin in the *JSI* data set, generally had lower cocitation counts in the SSCI and a pattern of cocitation showing less similarity to the rest of the author set. Some authors were, thus, visible and relevant to a focused

data set, in this case authors citing Lewin in the *JSI,* but were less visible in the SSCI as a whole.

That some authors are poorly connected to the rest of the author set is not an unusual outcome in cocitation studies. Poorly connected authors may represent those new to the field or authors connected to only a small portion of the entire author set (McCain, 1990). In the *JSI,* the second explanation seemed to apply. In this case, the poorly connected authors were not widely cited in the Social Science Citation Index and were not connected to many other names in the data set. Frequently, when the analysis includes poorly connected authors, the results are a skewed cocitation map and distorted results of other multivariate procedures.

The remedy McCain (1990) recommends is to compute a threshold for inclusion in the data set and then to iterate the multivariate procedures. In order to explore the structure with the poorly connected authors removed from consideration, I progressively tested threshold criteria for inclusion in the author list (McCain, 1990). After choosing an inclusion threshold I recomputed the multivariate analyses. The second solution leads to a map of intellectual structure that essentially eliminated the authors on one half of the first map and presents a greatly expanded view of the other half of the first map.

V.2. Lewinian Author Cocitation Context Analysis of the *Journal of Social Issues*

Data collection

Lewin is cited in 75 documents in the *Journal of Social Issues* from 1972 to 2001. I ranked cited authors in this set of documents by using Dialog's RANK command. Cocitation context data were collected for the top sixty authors cocited with Lewin (Table 2); that is, each pair of names was ANDED with Lewin K in the Social SciSearch database in Dialog between 1972 and 2001. The syntax took the following form: S CA=Lewin K and CA=Merton RK and CA=Deutsch M and PY=1972:2001. "CA=Lewin K" is the contextual filter. The raw co-occurrence counts were assembled in an Excel spreadsheet as a square matrix of 60 by 60 cells. Although the matrix lists only the 60 authors cocited with Lewin and does not mention Kurt Lewin[8], the reader needs to remember that, in fact, each author represented himself /herself previously paired with Kurt Lewin.

Matrix diagonal cell values

The choice of values for the matrix diagonal values can vary according to the requirements of the multivariate data analysis procedure employed by the researcher. McCain (1990) reported that cocitation studies frequently leave the diagonal values blank or recorded as "missing data." In Marion (2002), I left the diagonal cell values blank (recording them as missing data) for the cluster analysis, multidimensional scaling, and factor analysis. White & Griffith (1982) summed the top three co-occurrence values and divided that number by two. Morris (2001) inserted the row

[8] The Lewin appearing in the author list is Kurt Lewin's daughter, Miriam Lewin.

means data into the diagonal cells. White (2003) reviewed various methods authors have chosen for handling the diagonal. He demonstrated that recording the diagonal as missing data works well. Alternative satisfactory methods are inserting the row mean or using the author's highest cocitation count with another author is an estimate for the author cocited with himself. In this study I used the means of row data in the diagonals for the multivariate procedures and the Pathfinder network analysis.

Converting co-occurrence data to proximities

I converted the raw co-occurrence matrix to a proximities matrix by using SPSS PROXIMITIES (Pearson's product-moment correlation coefficient). The proximities matrix was the input for the multivariate procedures of cluster analysis (SPSS CLUSTER), multidimensional scaling (SPSS ALSCAL), and principal components analysis (SPSS FACTOR). The proximity matrix created a profile for each author in the data set by comparing the pattern of raw co-occurrence counts for each author compared with the pattern of co-occurrence counts for all the other authors. The profile matrix is preferred in cocitation studies because it compensates for differences in scale or for very large differences in raw frequency counts (McCain, 1985). The product-moment correlation evaluates the pattern of high and low cocitations across the set of authors. Authors with similar profiles have a similarity value (correlation) closer to +1. Authors whose profiles are dissimilar have a similarity value (correlation) closer to -1. A proximity matrix was the basis for executing three subsequent multivariate analyses—cluster analysis, multidimensional scaling, and factor analysis.

Cluster analysis

The proximities matrix was used for the multivariate procedures of cluster analysis (SPSS CLUSTER). Appendix B contains the command syntax employed to execute this routine. One useful output of SPSS CLUSTER is a dendrogram. I chose the hierarchical agglomerative approach with complete linkage, which is frequently employed in cocitation studies (McCain, 1990). There is no strict stopping rule to guide the researcher and no ideal number of clusters. The researcher determines the optimal number of clusters according to his/her judgment of what best informs the discussion. According to Aldenderfer and Blashfield (1984), the researcher should report his/her choice of clustering method, similarity measure, statistical program, basis for determining the number of clusters, and method for validating the clustering solution.

Figure 2 displays the dendrogram for the 60-author name set. The vertical black line indicates the stage in the agglomerative process where the five-cluster model is represented. The bold horizontal lines separate the clusters, with cluster labels located to the right of the vertical line. The overall appearance of the dendrogram shows an interesting pattern in the agglomerative process. The large cluster at the top of the graph grouped early in the clustering process, as did the clusters at the bottom of the graph, indicating the relative homogeneity within the clusters. The bottom two clusters, however, were linked rather late in the process and the joining of the top and the bottom clusters occurred quite late. This points to a lack of similarity between the top and bottom clusters. The relative dissimilarity between

the bottom and top clusters is a pattern that will be repeated in the subsequent analyses and discussed below.

Clusters

The cluster labels were based on reading the passages that cited the authors in the articles and on consulting with a subject expert. Below are descriptions of each cluster. The reader should note that some canonical authors, such as Merton, produced a large body of work**.** Although Merton was a sociologist, in this data set he is placed in the cluster with social psychologists, where he is cited for his work on social structure. Merton emphasized that roles place individuals in relations with others and that group membership provided reference points for comparing expectations and outcomes. Merton's "theories of the middle range" lent themselves to doable research projects (Rytina 1992, p.1974). Merton's work, therefore, is quite compatible with the work of the social psychologists in this cluster.

The three clusters at the top of the dendrogram reflect Lewin's major research interests—social psychology, child development, and ethnic and race relations. The two clusters at the bottom of the dendrogram reflect historical appraisals of the Society for the Psychological Study of Social Issues, *JSI*, Lewin's contributions, and the practice of action research.

Social Psychology Cluster

The largest group of authors consists of prominent social psychologists (including the sociologist Merton). Lewin is considered one of the founders of Social Psychology, which he helped shape through his insistence on applying experimental rigor to studying social behavior in real-world events and processes (Rogers, 1994). Several authors in this cluster, including Allport, Sherif, and Newcomb, worked on important research in Social Psychology at the same time as Lewin.

The large Social Psychology cluster actually includes several sub-groups. The authors at the top half of the cluster on the dendrogram include Janis ("group think"), Milgram ("obedience to authority" experiments), Rokeach (dogmatism), Festinger (cognitive dissonance), Bandura (social learning theory), Berkowitz (aggressive cue theory), Asch (conformity and "line-length" experiments), Sherif ("summer camp" experiments and "competition leads to aggression"). Although all these authors are very well known in psychology, the common thread is their work on aggression, hostility, and competition. One of the major themes in the *JSI* is recognizing and combating the negative aspects of competition, aggression and hostility, whether it occurs interpersonally between family members or couples, or at the institutional, national, or international level.

The bottom half of this cluster includes authors associated with two additional specialty areas in Social Psychology. One specialty is Group Dynamics and includes a number of Lewin's students. Cartwright, French and Zander studied the mechanisms of group behavior, focusing less on the individual and more on group level phenomena. The other sub-group includes Coch, Raven, and Kipnis, who are

cited for their work on power and authority. Raven and Coch were both close associates of Lewin.

Child Development Cluster

This cluster reflects Lewin's groundbreaking work with children both in Germany and at the University of Iowa. Authors in this group include Piaget (stages of child cognitive development), Langer (mindfulness), Dollard (frustration-aggression), Kohlberg (stages of moral development), Bronfenbrenner (comparative child rearing practices) and Barker (ecological psychology). Kanter is included in this group for her work on communication between men and women.

Social Justice Cluster

The Social Justice cluster represents Lewin's deep and abiding concern with prejudice and discrimination, which started with his experiences with fellow soldiers as a WWI artilleryman and was further influenced by the Holocaust, World War II, and the anti-Semitic quotas of American academia. Lewin formulated the concept of action research in response to the events of that time and wrote about the status of the minority group, a theme that resonates with SPSSI. SPSSI strongly supported the major civil rights struggles of the past fifty years, including equal opportunity for African-Americans, women's fight for equal treatment, the rights of the disabled, etc. Support for these causes is reflected in the content of *JSI.* Authors in this cluster include Pettigrew (effects of discrimination on African-Americans), Tajfel (social identity theory and ethnocentrism), Brewer (women's equality).

History of SPSSI Cluster

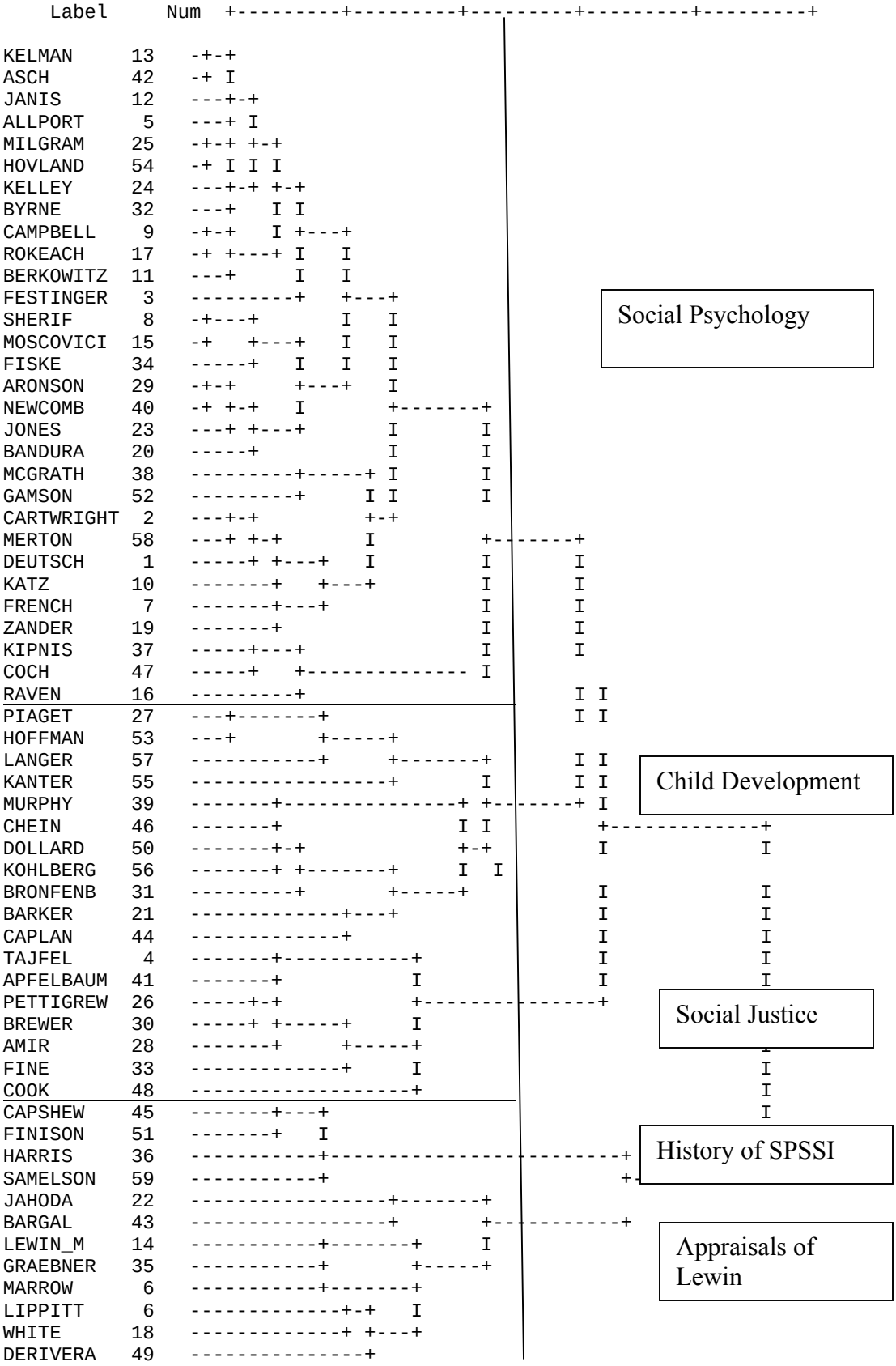
This clusters refers to critical appraisals and historical accounts of the development of SPSSI and *JSI. JSI* published two special issues in 1986 to celebrate the fiftieth anniversary issue of SPSSI. As was discussed in the previous chapter, Lewin was an extremely important figure in the history of the Society. He served as president and helped define the concerns of the Society and *JSI.* Authors in this group include Capshew, Samelson, and Finison, all of whom wrote historical analyses. Capshew published a history of professional psychology in the United States. Finison wrote on the early history of SPSSI. Samelson is an expert on the history of Social Psychology.

Appraisal of Lewin Cluster

JSI also published a special issue on the one hundredth anniversary of Lewin's birth. This issue included articles by Lewin's students, Deutsch, French, and White, and Lewin's daughter, Miriam. The historian de Rivera is cited for his book assessing the contributions of Lewin's Berlin group. Lewin's colleague Marie Jahoda, wrote an account of the CCI (Commission on Community Interrelationships), which was an action research group founded by Lewin to combat anti-Semitism. Alfred Marrow was Lewin's student and author of an important biography of Lewin. Marrow was part of Lewin's inner circle and had access to Lewin's students and colleagues, which is reflected in the first-hand accounts included in the book. Miriam Lewin is cited with Graebner because of an exchange of articles. Graebner wrote an article that was critical of Lewin's ideas of democracy and action research. Miriam Lewin defended

her father's model of action research against Graebner's claim that Lewin's action research model was elitist instead of truly democratic.

Figure 2. Cluster Analysis—60 Authors Cocited with Lewin in *JSI*



Multidimensional Scaling

The proximities matrix computed above provided the input data for the SPSS ALSCAL routine. Appendix C contains the syntax I used to execute the procedure. The two-dimensional model appears as Figure 3. This solution yields an R square value of .88 indicating that 88% of the variance in the data is explained with stress of .19 as expressed by Kruskal's Stress. Appendix F contains the stimulus coordinates used to place the author names on the map.

I followed the convention of drawing loops around the data points corresponding to the clusters on the dendrogram (Kruskal, 1977). The juxtaposition of the cluster loops over the MDS placement of names illustrates the contrasting information obtained from the two analyses (discussed in the previous chapter). The result is that although some authors are placed closely together on the MDS map in such a way that the cluster loop is easily drawn around the names (e.g. The History of SPSSI cluster), other authors are widely separated from their cluster colleagues (e.g. Child Development cluster).

Thus, Child Development cluster authors Isador Chein and Gardner Murphy are placed on the side of the map with the authors cited for historical work. Chein and Murphy were both closely associated with Lewin. Chein was Lewin's student and involved with the Commission on Community Interrelations and Murphy was Lewin's contemporary. They are cited for their research related to human development but the overall pattern of similarity indicates citation with the historical cluster authors. Although placed in the Child Development Cluster in the dendrogram, in the MDS map they are placed close to the historical clusters,

indicating their affinity to those authors. Likewise Bronfenbrenner, cited for his work on comparative child-rearing practices, is in an isolated corner of the MDS map with other authors noted for their applied work. On the other hand, psychologists Kohlberg, Langer, and Hoffman are placed close to the social psychologists whose work is related to theirs.

As previously noted, a common pattern in cocitation studies is to find an array of subject areas on one dimension and various methodologies on the other. In this case the horizontal or X-axis appears to represent a continuum from a focus on group history, such as SPSSI and social change in large groups on the left (Harris, Finison, Capshew), to a focus on social psychology in the center right, and individual psychology, especially topics of child development, on the far right. The dominant theme of the vertical or Y-axis is a continuum from theory to applied research. Thus, at the top of the map appear authors writing about theoretical bases of power and authority and overcoming resistance to change (Coch and Kipnis) while at the bottom of the map are located authors writing about power and authority as important to understanding and changing ethnic, race, and gender relations (Cook, Fine, Amir).

Names appearing close to the center of the map are regarded as those with ties to many others, while those with fewer ties to others are located on the periphery. Merton (social structure), Katz (author of the key text *The Social Psychology of Organizations*), Aronson (Lewin's student and very influential social psychologist), and McGrath (social psychologist focused on group and organizational dynamics) are placed in the center of the map.

A large number of authors from the Social Psychology Cluster are tightly compressed just to the right of center, which enables the map to display the outlier groups to the far left of the map. These prominent figures in Social Psychology produced many of the key concepts and research findings in the discipline. Their placement close to the center of the map indicates their ties to other authors in this research.

The Child Development group spans the length of the Y-axis, which reflects a wide range of work in this area, ranging from theoretical to applied. Piaget, Hoffman, Langer, and Kohlberg anchor the X-axis. All wrote about individual human development. Barker, Lewin's student associated with ecological psychology, is located close to another two of Lewin's students, Raven and French. At the opposite end of this cluster is Bronfenbrenner (comparative child rearing practices), placed close to Pettigrew (racial prejudice and discrimination). An interesting feature of this group is its diversity as reflected in the scattered placement of author names.

The Social Justice group anchors the Y-axis. Stuart Cook, the director of CCI (Commission on Community Interrelationships) exemplifies their work. The most peripheral cluster contains the authors cited for work on the history of SPSSI and the Society's role in the history of psychology. This reflects Lewin's role as an extremely important figure in the history of psychology as a discipline and SPSSI in particular.

The other cluster on the left side of the map includes authors cited for their work interpreting Lewin's research and theories and placing it within an historical context. All of these authors, with the exception of Graebner, are closely identified with Lewin. Miriam Lewin is his daughter. Marrow, White, Lippitt, and Jahoda are

first generation Lewinians. Bargal is a second generation Lewinian. De Rivera wrote a history of Lewin ‘s Berlin group. Graebner, as discussed above, wrote an article critical of Lewin’s assumptions about democratic leadership and action research.

The map as a whole represents the range of subjects covered by articles citing Lewin in the *JSI* between 1972 and 2001. Two very different content areas emerged. The first content area springs from some special topics—the issue commemorating Lewin’s birthday and the anniversary issue reflecting on the history of SPSSI. In this broad content area Lewin’s work and contributions are examined and discussed but it is in the second general content area that the authors use Lewin’s work as it relates to the subjects of Lewin’s research. Authors cocited with Lewin in the second area are cited for which that spans the subjects Lewin wrote about—social justice, social psychology, and individual psychology.

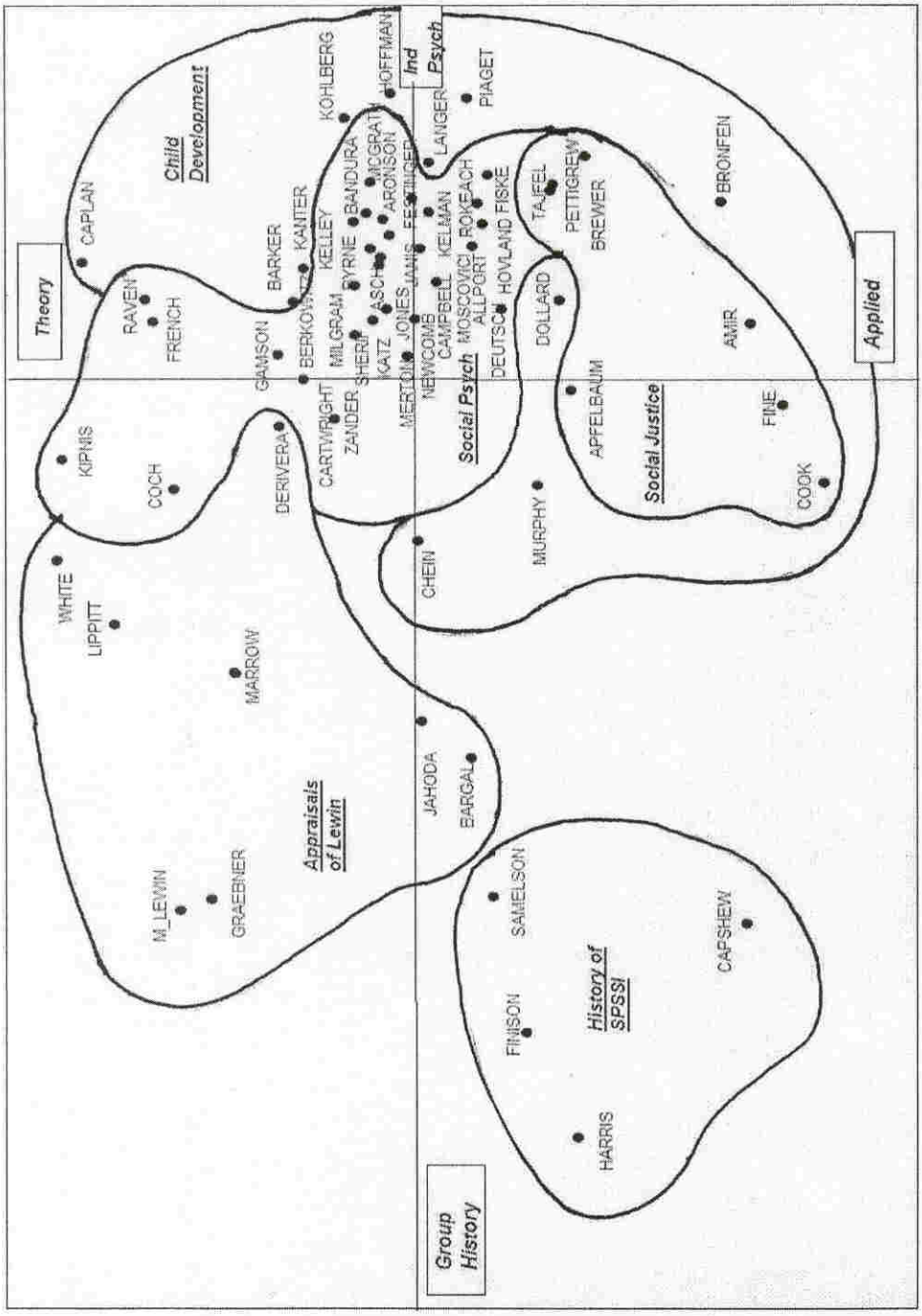


Figure 3. MDS Map—60 Authors Cocited with Kurt Lewin in *JSI*

Principal Components Analysis

Principal components analysis (PCA), a variation of factor analysis, is the third procedure often employed by cocitation researchers in analyzing intellectual structure. This routine also relies on a proximity matrix computed from the matrix of raw cocitation frequency counts. Appendix D contains the syntax for SPSS FACTOR. This study used OBLIMIN rotation of the factors to increase the amount of variation from within the correlation matrix that can be explained in the analysis. Oblique rotation takes into account not only the uncorrelated factor relationships but also any correlated factor relationships, which are likely in exploratory analyses of real-world data (Gorsuch, 1984; Hair et al., 1998).

As discussed in the previous chapter, in cases where oblique rotation (OBLIMIN) is used, the factor loadings and the factor variable correlations are no longer identical. The factor structure matrix, which reports the correlation of variables to factors, therefore, is especially useful. The factor loadings are interpreted as subject specialties. Table 3 displays the factor structure matrix, which is a matrix of correlations between variables and factors. The factor structure matrix illustrates the factor loadings with a minimum of .4 for the sixty authors cocited with Lewin in the *JSI*. Many of the sixty authors have loadings on several factors, although the last four factors are minor. Eight factors explain 83% of the variance.

The value of conducting several analyses to explore the data is illustrated by examining the results for three authors discussed previously—Chein, Murphy, and Bronfenbrenner. The placement of these authors on the MDS map seems to conflict with their cluster membership. In particular, the loop on the map stretched in a long

arc in order to capture their names. The loadings for these three in the factor structure matrix provide additional information. Bronfenbrenner had the second highest loading for the Child Development group but it is the only component in which he loads above the threshold. Thus, he is closely linked with the other Child Development authors but is not linked with other authors, which provides an explanation for his outlier placement on the MDS map.

Chein, on the other hand, loaded on six of the factors, indicating broad use of his work although his largest loading was with the Child Development authors. He and Murphy, however, were the only members of the large Social Psychology cluster who also had significant loadings on Component 2, which is comprised of the authors cited for their historical appraisals. Chein's placement with the Child Development cluster and close to the historical pole of the X-axis and in the middle of the Y-axis can be explained by examining the triangulated information provided by the three different procedures.

Murphy, as stated above, was the second author with a high loading on the Social Psychology component to also have a sizable loading on the historical component. His seemingly odd position on the MDS map is also clarified by understanding that he was a member of two groups, made clear by the PCA.

Component 1 Social Psychology accounts for 50% of the variance with 43 authors loading at a minimum of .4. As a whole, this factor included many authors who are generally regarded as central figures in social psychology and are important figures apart from any connection to Lewin. Most of the authors located on the right half of the MDS map loaded on this factor, including social psychologists, the child

developmentalists, and the group dynamics authors. Authors who load highest on this factor included Aronson (Lewin's student associated with cognitive social psychology), Newcomb (social change), Hovland (communication and persuasion), Byrne, Milgram, and Jones (Lewin's student). No authors exhibited what White (2000) termed a "crystallized citation image," indicating that an author loads at a high level only on this factor. This component seems to broadly represent the subject of this part of the data set --social psychology.

Component 2 Historical Appraisals explained 10% of the variance with eight authors loading at the threshold of .4. Three authors loaded only on this factor and are placed on the far left of the MDS map. Finison and Capshew had the highest loadings of the authors on this component and also loaded solely on this factor. Authors in this group are cited for their writings on retrospective appraisals of SPSSI, *JSI*, and Lewin's work and are generally concerned with history. These authors wrote about topics delimited by the particular concerns of SPSSI and readers of *JSI*, in contrast with the Component 1 authors, who are prominent across psychology and other social sciences.

Component 3 Social Justice and Component 4 Child Development each account for 6% of the variance in the data. Component 3 authors, cited for their work on ethnic identity, racial bias, and gender discrimination, included Pettigrew, Cook (anti-Semitism), Amir, and Fine (gender discrimination). Fine and Cook had loadings above the threshold only on this factor. Cook was the Director of the Commission on Community Interrelations. Component 4 authors are noted for their work from a social developmental perspective – Dollard on frustration and aggression,

Bronfenbrenner and Barker on psychological ecology and environmental influences, and Piaget on cognitive development. Bronfenbrenner, well known for his work on comparative childrearing practices, was the only author to load solely on this component.

Minor Component 5 Appraisals of Lewin accounts for approximately 4% of the variance. The high loading on Component 5 belonged to authors who wrote about Lewin's conceptions about collective action and implications for majority rule. Lewin's daughter, Miriam, also a psychologist, had the highest loading of the entire author list and loaded above the threshold only on this component. Her citation image in this data set was very crystallized. Miriam Lewin co-edited the *JSI* issue commemorating the anniversary of Lewin's birth. In this set of articles she functioned as her father's apologist. As noted above, she wrote a response to Graebner's criticism of her father's experiments with leadership style.

Minor components 6, 7, and 8 together account for approximately 7% of the variance. Most of the authors loading on Component 6 Power and Authority were cited for their work on power, authority, and group structure. Coch was strongly identified with this component. Component 7 Gender Communication was almost insignificant in the total amount of variance explained, although a total of fourteen authors had loadings over the .4 threshold. This factor was generally concerned with social and group structure. Only two authors, Langer and Kanter, have large loadings. Factor eight deals with the topic of attitude formation and change. Thirty-four authors load on this factor.

Just as authors with a crystallized citation image can be identified, likewise one can also see names that load on several factors, which White termed a "diffuse" image. Authors with a diffuse citation image have been cited in a number of contexts; their work is broadly useful across the discipline. In this set of articles, a number of authors can be thus identified. In fact, approximately two-thirds of the authors have loadings above .4 in at least three components and 25% of the authors load above .4 in five or six components. Only eight authors—Finison, Capshew, Harris, Cook, Fine, M. Lewin, Bronfenbrenner, and Caplan—load on a single component. This last group of authors is found on the periphery of the MDS map, particularly the lower left quadrant, where the historians are located. Authors with a diffuse citation image are generally found in the social psychology cluster in the crowded center right of the MDS map. Authors loading on six components are Chein, Rokeach, Allport, Merton, Sherif, and Kelman.

Table 3. Structure Matrix—60 Authors Cocited with Lewin in *JSI*

	Component							
	1 Social Psych	2 Hist. Apprais.	3 Social Just.	4 Child Devel.	5 Apprais. Lewin	6 Power Author.	7 Gender Com.	8 Attitude Form.
ARONSON	.949			.469		.447		.497
NEWCOMB	.915		.467	.494		.556		.528
HOVLAND	.911			.469		.589		.513
BYRNE	.906		.417	.492		.532		.491
MILGRAM	.903			.468		.462		.548
JONES	.897		.439	.491			.419	.551
KELMAN	.889		.447	.462		.604	.406	.587
ASCH	.884		.434	.426		.541		.697
KELLEY	.871		.462	.496		.492		.603
JANIS	.861			.506		.559	.467	.601
SHERIF	.861		.516	.439		.437	.430	.609
MERTON	.847		.415	.580		.615	.410	.492
BANDURA	.833		.453	.624				.402
DEUTSCH	.830		.469	.402		.534		.713

Table 3. Structure Matrix—60 Authors Cocited with Lewin in *JSI (cont.)*

BERKOWIT	.816		.406	.640		.605		.527
CARTWRIG	.810					.707	.401	.498
KATZ	.803		.468	.451		.646		.412
ALLPORT	.801		.536	.529		.412	.484	.620
MOSCOVIC	.789		.572					.774
ROKEACH	.778		.586	.662		.463	.524	.427
FISKE	.772		.674	.425			.411	.584
CAMPBELL	.769		.656	.648		.532	.472	.506
FESTINGE	.717		.473	.481		.542		.612
MURPHY	.698		.504	.559	-.490			
LANGER	.648			.607			.616	.497
GRAEBNER		.808			-.408			
LEWIN		.807						
MARROW		.751				.537		
DERIVERA	.468	.730		.469				
BARGAL		.660	.516					
PETTIGRE	.536		.897					.504
AMIR			.864					.483
COOK			.836					
FINE			.814					
PIAGET	.480			.916				
BRONFENB				.864				
KOHLBERG	.546			.840				
DOLLARD	.645		.482	.833				
BARKER	.420			.794				
HOFFMAN	.462			.780			.430	
CAPLAN		.407		.775				
CHEIN	.520	.601	.407	.653	-.414	.411		
FINISON					-.885			
CAPSHEW					-.885			
SAMELSON		.547			-.827			
HARRIS					-.815			
JAHODA		.475			-.624		.503	
COCH	.418					.897		
KIPNIS	.548					.860		
RAVEN	.581					.825		.571
MCGRATH	.568					.752		.469
FRENCH	.680			.425		.726		
LIPPITT		.631				.725		
WHITE		.605				.716		
ZANDER	.595					.709	.416	.610
KANTER	.456		.426	.529		.531	.681	
GAMSON	.620					.554		.821
APFELBAU	.490		.620					.815

Table 3. Structure Matrix—60 Authors Cocited with Lewin in *JSI (continued)*

BREWER	.524		.714					.741
TAJFEL	.641		.628					.707

Table 4 illustrates how the various factors are correlated with each other. Not surprisingly, the strongest relationships are between Components 4 Child Development, 6 Power and Authority, and 8 Attitude Formation, which are strongly correlated with Component 1 Social Psychology. It appears that Components 4, 6, and 8 are specialties within the large group of social psychologists. As explained above, Component 4 includes the developmentalists, Component 6 involves the power, authority, and group dynamics authors, and Component 8 deals with attitude formation and change. Strikingly, authors loading on these factors are found on the right side of the MDS map. Component 2 Historical Appraisals and Component 5 Appraisals of Lewin are mildly correlated. The authors loading high on these factors are found on the left side of the MDS map where the authors are cited for their work on historical analyses of Lewin and SPSSI.

Table 4. Component Correlation Matrix—60 Authors in *JSI*

Values >.2

Component	1 Social Psych	2 Hist. Apprais.	3 Social Just.	4 Child Devel.	5 Apprais. Lewin	6 Power Author.	7 Gender Com.	8 Attitude Form.
1	1.00		.37	.46		.43	.29	.48
2		1.00			-.28	.29		
3	.37		1.00	.27				.34
4	.46		.27	1.00		.25	.24	.17
5		-.28			1.00			
6	.43	.29		.25		1.00		.28
7	.29			.24			1.00	
8	.48		.34			.28		1.00

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Pathfinder Network Analysis (PFNet)

The output of the Pathfinder algorithm is a PFNet. The software includes a feature that enables the researcher to manually arrange any of the data points (author names in this research) for maximum clarity without changing the underlying relationships. I followed White's (2003a) recommendation and used the matrix of raw cocitation counts as the input matrix. The diagonals contained the mean cocitation counts for each row. Figure 4 is a copy of the PFNet for the 60 authors with the parameters set for the sparsest network (r = infinity, q = n – 1).

The most striking feature of the graph is the centrality of Festinger particularly for the Social Psychology Cluster. Festinger is a "star," or central figure in the network because he has links to many authors (Scott, 2000). Most of the experimental social psychologists are directly connected to Festinger, who was one of Lewin's most prominent students. Festinger, one of the most influential figures in psychology, is highly cited for his research on cognitive dissonance (Haggbloom et al., 2002).

Several other authors provide a "gatekeeper" function in that they connect other authors to the rest of the name set (Scott, 2000). Conceptually, authors linked to the "gatekeeper" are dependent on their relationship to that figure for connection to the rest of the network. Social network analysis interprets the "gatekeeper" as possessing a high degree of "betweenness" (Scott, 2000). "Gatekeepers" are most frequently cocited with the authors with whom they are linked. Bandura (Social Learning Theory) links the authors in the Child Development Cluster to Festinger and the other social psychologists. Lewin's associate Allport connects the Social Justice Cluster authors to Festinger and social psychology. French is another "gatekeeper"

linking Festinger to researchers, such as Coch and Raven, who focused on aspects of organizational behavior. In Figure 4 Coch, Raven, Kipnis, and McGrath are each most frequently cocited with French. French, however, is most frequently cocited equally with Cartwright and Festinger. The links allow the viewer to follow the connections between subject specialties as reflected in the cocitation choices of citing authors.

The authors placed on the periphery of the PFNet are those who on the left side and periphery of the MDS map. The History of SPSSI and Appraisals of Lewin Clusters are comprised of those who are less well connected to the rest of the author name set. Authors in these two clusters are arrayed along the left and top of the diagram. Marrow, Lewin's student and biographer, holds a central role in this section of the network in that he is connected to several figures from these clusters.

In the lower right portion of the network is a constellation of names associated with the Social Justice Cluster on the dendrogram and MDS map. Sherif occupies a position of centrality with seven names directly linked to his although his primary loading is with the social psychologists. Sherif's work is highly cocited with authors from both specialties. Tajfel is placed in a position that links four authors to the network.

Surprisingly Piaget is placed between Bandura and Kohlberg rather than with Bronfenbrenner and Barker, with whom he is placed on the dendrogram and the MDS map. This placement may occur because of the connection between Piaget's stages of cognitive development and the development of prejudice in children. Piaget's location on the MDS map and the PFNet illustrates the different information obtained

from each method. The PFNet shows Piaget is most frequently cocited with Bandura and Kohlberg. The overall pattern of Piaget's cocitation profile places him with the child developmentalists Barker and Bronfenbrenner.

The presence of many small "cliques" in this network makes it somewhat difficult to visually discern relationships. "Cliques" are strictly defined as networks where all the nodes (authors in this research) are directly linked to each other; however, the term is also applied more loosely to groups of names that form a circle (Scott, 2000). It is possible that the appearance of some of the cliques in this study is an artifact of tied low cocitation counts. (Recall that the parameters for generation of the PFNet were set to include only the strongest link or highest cocitation frequency between authors.) For example, Marrow is a member of several cliques. First, he is part of the M. Lewin, Graebner, Lippitt clique, which wrote appraisals of Lewin's work for the anniversary issue of *JSI*. Similarly, Marrow is part of another historical group—the clique with Jahoda and Finison. This is not surprising given Marrow's role as author of the definitive biography of Lewin. Cartwright, French, and Festinger form another clique. All three were Lewin's students who studied group and organizational dynamics and are very prominent social psychologists in their own right. Bandura, Rokeach, and Festinger comprise another triangle that studied cognitive components of social behavior, such as dogmatism.

We can follow the placement of the three authors—Chein, Murphy, and Bronfenbrenner—particularly discussed above because they illustrate the contrasting information derived from different methods of analysis. In the PFNet Chein is unequivocally one of the names linked to Festinger without any equally important

connections to other authors. Bronfenbrenner is part of a small clique including Barker, with whom he is frequently cited. Bronfenbrenner is also linked to Bandura, who is a very highly cited psychologist. In contrast, Murphy is part of a small clique with the historians Finison and Capshew although Murphy also links with the social psychologist Allport. Once again the dual affinity of Murphy and Chein in this data set is visible as their placement shifts from authors representing one facet of the data set to another, again reflecting whether one is examining a similar pattern of cocitation or frequency cocitation counts.

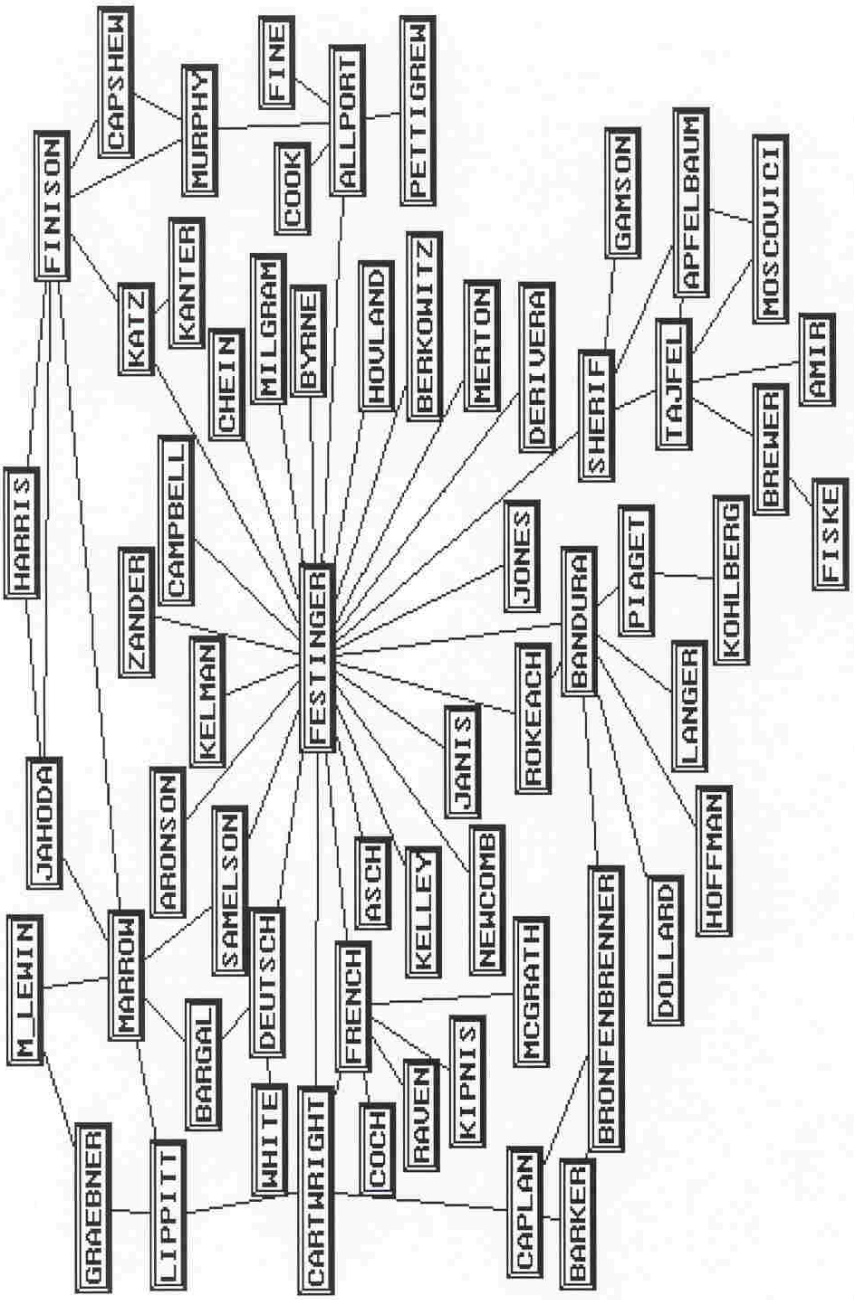


Figure 4. PFNet—60 Authors Cocited with Kurt Lewin in *Journal of Social Issues*

In the same paper mentioned above, White (2003a) also demonstrated that a researcher could substitute an author's main specialty loading from the principal components analysis for the author's name in the PFNet. In this analysis the specialty loadings corresponded well overall to the placement of names in the PFNet. Accordingly, Figure 5 displays the same network configuration from Figure 4 with highest component loading substituted for an author name. The results of the substitution confirm White's results. Authors from the Social Psychology specialty, for example, largely surround Festinger. Marrow is generally connected to other authors cited here for their historical analyses of SPSSI or Lewin's contributions.

White noted that when an author's main specialty assignment is not consistent with the name placement on the PFNet, often the second highest loading would correspond. This is precisely the case for Bandura, whose primary loading (.833) is with the Social Psychology specialty but who has a strong loading (.624) with the Child Development specialty. The PFNet, therefore, appears to represent quite well the specialty structure of authors cocited with Lewin in *JSI.*

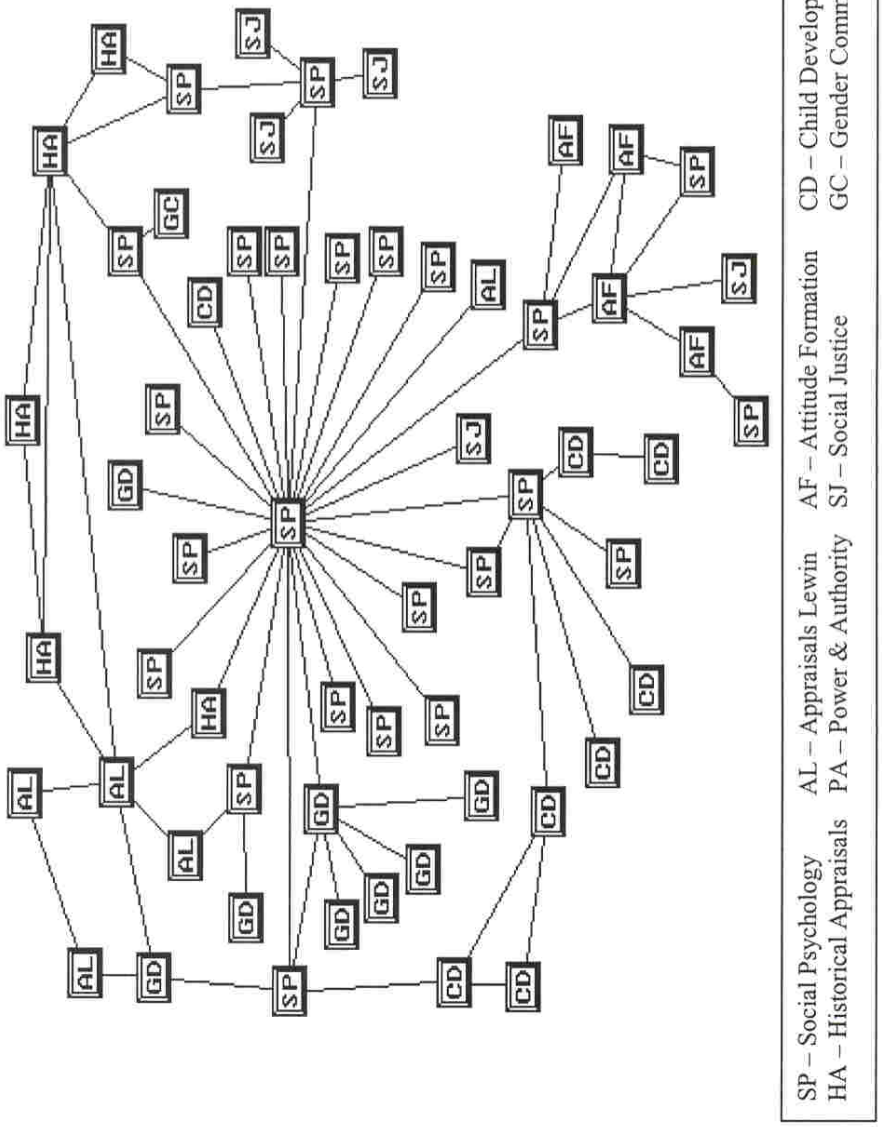


Figure 5. PFNet—Main Specialty Loadings of 60 Authors Cocited with Kurt Lewin in *Journal of Social Issues*

Determination of the revised author set

After completing the analysis of intellectual structure for the sixty-author data set, I wanted to determine whether several low frequency authors were distorting the results. The results of the MDS map, in particular, seemed to indicate two very different content areas. Authors placed on the right half of the map were very tightly compressed in contrast to the widely spaced authors on the left half of the map. I experimented with two cutoff points for inclusion in a second analysis. A frequently used cutoff for inclusion in a cocitation set is an average of one cocitation per year for the period covered by the analysis (McCain, 1990). In this research the overall frequency of cocitation did not meet the once per year rule for almost all the highly cocited authors. This study explored the potential for mapping intellectual structure from a small, focused data set, which made it desirable to establish inclusion criteria based on a more liberal threshold.

Sandstrom's (1998) method for determining inclusion of authors in her exploratory research, based on McCain (1990), provided an appropriate model for this study. She also faced a situation where a number of authors in her small data set did not meet the usual inclusion rule. Consequently, Sandstrom conducted a pretest to establish criteria for including authors that were marginally connected to the rest of the author set. After experimenting with several thresholds, Sandstrom set the following rule: When the mean cocitation rate falls below the expected value, retain a cited author so long as the cumulative percentage of the distributed cocitation values is no higher than 75% at the expected frequency of cocitation (p.434). In a similar fashion I generated the summary statistics and set a threshold for inclusion in the

revised author set (described below) except that my inclusion threshold was based on an author's cocitation rate at the 75th percentile being equal to or greater than the overall mean cocitation rate for the entire list.

SPSS Frequencies generated summary statistics of cocitation values for each author in the data set. These statistics included the mean, standard deviation, range of values, cumulative percentages, and median values. Table 3 displays the mean cocitation rate and frequency distribution for the 60 authors cocited with Lewin. The mean cocitation rate for the 60 authors was seven, which is low considering the 30-year time span of the study, according to the one citation per year rule.

Table 5 contains the frequency distribution statistics for the 39 authors from Table 3 who met the threshold criterion, which was modified to include four names, Marrow, Raven, Kanter, and Murphy, whose mean cocitation rate at the 75th percentile on the frequency distribution was six. I wanted to include as many authors as possible without distorting subsequent analyses and chose to include these four authors. The two-dimensional MDS results based on the threshold of a frequency minimum of six were improved to RSQ = .94 and Stress = .11. The mean cocitation rate for the 39 authors in Table 6 rose to 15 when the inclusion threshold was set at six.

The data for authors with an individual mean cocitation frequency that fell below six are shown in gray. These authors were dropped from a subsequent analysis. Most of the names dropped from the author list constituted a group who wrote historical appraisals of the journal and/or of Lewin's contributions. These authors comprised the last two clusters on the dendrogram and were placed on the left side of

the MDS map. Several authors in this group, which included daughter Miriam Lewin, were close associates of Lewin. These authors are relevant to understanding the intellectual structure of *JSI* from a Lewinian perspective but are not widely cited in the literature outside this journal. Other authors wrote historical analyses of *JSI* and Lewin's contributions, topics that are intertwined because Lewin was one of the early presidents of SPSSI, as were many of his students.

The authors remaining, after removing the group with low cocitation frequencies in the SSCI, are prominent psychologists, especially social psychologists. The two author lists (the original 60 name set and the revised 39 name set) offer two perspectives on the intellectual structure of *JSI.* The complete list includes names socially associated with Lewin and historians writing about intellectual and social history. Removing these names because of their low frequency of cocitation with others on the original list, results in a list comprised largely of very well known psychologists. Some of these writers were also closely associated with Lewin.

Following the tables below are results of the multivariate analyses for the edited 39-author list. The same syntax, found in Appendices B, C, and D, was used for these analyses as for the 60-author analysis, except, of course, for the truncated name lists.

Table 5. Frequency Distribution Statistics—60 Authors Cocited with Lewin in *JSI*

Mean Cocitation Rate = 7 Gray = removed for low count

Authors		DEUTSCH	CARTWRIGT	FESTINGE	TAJFEL	ALLPORT	MARROW	LIPPITT
Mean cocitation		16	14	27	13	17	5	6
Percentiles	25	6	4	7	2	5	1	2
	50	13	11	18	8	13	3	4
	75	22	20	38	17	25	7	7

Table 5. Frequency Distribution Statistics—60 Authors Cocited with Lewin in *JSI* *(continued)*

Authors		FRENCH	SHERIF	CAMPBEL	KATZ	BERKOWIT	JANIS	KELMAN
Mean cocitation		10	19	11	13	9	10	8
Percentiles	25	1	5	3	5	2	2	2
	50	8	13	9	9	9	7	6
	75	16	28	17	19	14	14	15
Authors		LEWIN_M	MOSCOVICI	RAVEN	ROKEACH	WHITE	ZANDER	BANDUR
Mean cocitation		1	8	4	7	2	4	17
Percentiles	25	0	1	0	1	1	1	3
	50	1	5	2	5	2	3	15
	75	2	12	6	9	3	5	26

Authors		BARKER	JAHODA	JONES	KELLEY	MILGRAM	PETTIGREW	PIAGET
Mean cocitation		7	2	14	16	8	4	10
Percentiles	25	1	1	3	5	1	1	2
	50	4	2	9	11	5	3	8
	75	10	4	20	24	13	5	15

Authors		AMIR	ARONSON	BREWER	BRONFEN	BYRNE	FINE	FISKE
Mean cocitation		2	9	9	6	5	1	9
Percentiles	25	0	2	1	1	0	0	2
	50	1	6	5	3	3	1	6
	75	3	13	12	7	10	2	12

Authors		GRAEBNER	HARRIS	KIPNIS	MCGRATH	MURPHY	NEWCOMB	APFELBAUM
Mean cocitation		1	1	3	6	5	9	2
Percentiles	25	0	0	0	2	1	2	1
	50	1	1	2	4	3	6	1
	75	1	2	4	8	7	12	3

Authors		ASCH	BARGAL	CAPLAN	CAPSHEW	CHEIN	COCH	COOK
Mean cocitation		13	1	1	1	4	6	2
Percentiles	25	2	0	0	0	1	1	1
	50	8	1	1	1	2	4	2
	75	19	2	2	2	5	8	4

Authors		DERIVERA	DOLLARD	FINISON	GAMSON	HOFFMAN	HOVLAND	KANTER
Mean cocitation		2	5	1	2	3	7	4
Percentiles	25	0	1	0	0	0	1	1
	50	1	3	1	1	1	4	4
	75	3	6	2	3	5	11	6

Authors		KOHLBERG	LANGER	MERTON	SAMELSO
Mean cocitation		5	4	8	1
Percentiles	25	1	0	1	0
	50	3	2	4	1
	75	8	6	12	2

Table 6. Frequency Distribution Statistics—39 Authors Cocited with Lewin in *JSI*

Mean Cocitation Rate = 15

Author		DEUTSCH	CARTWRIGH	FESTINGE	TAJFEL	ALLPOR	LIPPITT	FRENCH
Cocitation Mean		23	20	41	19	24	7	15
Percentiles	25	13	11	20	6	13	3	7
	50	21	18	37	13	24	5	13
	75	27	25	61	25	33	9	22

Author		SHERIF	CAMPBELL	KATZ	BERKOWIT	JANIS	KELMAN	MOSCOVI
Cocitation Mean		28	16	18	14	15	12	12
Percentiles	25	13	10	10	9	7	7	5
	50	23	14	16	11	13	12	10
	75	37	19	24	17	19	17	16

Author		RAVEN	ROKEACH	BANDURA	BARKER	JONES	KELLEY	MILGRAM
Cocitation Mean		6	10	26	10	21	25	12
Percentiles	25	2	5	16	4	9	14	6
	50	5	9	23	9	18	20	11
	75	10	13	33	13	26	34	16

Author		PIAGET	ARONSON	BREWER	BRONFEN	BYRNE	FISKE	MCGRATH
Cocitation Mean		16	13	13	9	8	13	8
Percentiles	25	7	5	3	2	3	6	3
	50	13	12	8	5	8	11	6
	75	17	15	19	12	11	18	11

Author		MURPHY	NEWCOMB	ASCH	COCH	DOLLAR	HOVLAN	KOHLBERG
Cocitation Mean		6	14	20	8	7	11	8
Percentiles	25	2	7	9	2	3	5	3
	50	5	11	19	6	6	9	6
	75	9	20	27	10	10	16	9

Author		LANGER	MERTON
Cocitation Mean		7	11
Percentiles	25	2	4
	50	5	10
	75	8	15

Cluster analysis

Figure 6 displays the dendrogram for the top 39 authors cocited with Lewin in the *JSI* (selected at the minimum frequency of six cocitations). Cluster labels are boxed on the right with clusters separated by bold horizontal lines. The revised author set is divided into six clusters and one isolate. These clusters represent key areas of Lewin's contributions to social science. Group and organizational behavior, social justice, learning, and child development are areas in which Lewin made significant contributions. The authors cited with Lewin are many of the most prominent names in the discipline of Social Psychology. Below are descriptions of the clusters.

Interpersonal Influence Cluster

This is the largest cluster comprised of fourteen social psychologists, who are many of the most commonly cited authors in the discipline. These authors focused on the mechanisms involved in conformity and changing individuals' attitudes especially within a social context. Janis ("group think"), Milgram ("obedience to authority" experiments), Hovland (communication and persuasion), Festinger (cognitive dissonance) are examples of the authors and research cited. One of Lewin's major interests was in changing attitudes, particularly with the goal of increasing social justice.

Organizational Behavior

Three authors in this cluster, Cartwright, French, and Raven, worked closely with Lewin on aspects of organizational behavior. French and Raven are well known

for their work on power and authority and issues of social control. Merton is cited in the *JSI* articles for his work on social structure.

Social Justice

As has been discussed previously, both Lewin's work and SPSSI share a deep concern with issues of social justice and ameliorating the effects of prejudice and discrimination. Authors in this cluster are cited for their work in the applied dimension of this concern, such as Brewer's work on gender equality.

Organizational Change

This small cluster consists of three close associates of Lewin. Coch is cited for an article published in *Human Relations,* which discussed an organizational intervention performed with Lewin. Lippitt is known as part of the Lewin, Lippitt, White experiments on leadership as well as studies of group dynamics. Marrow is largely cited for his biography of Lewin, in which he recounts the context for as well as the content of Lewin's life and work.

Social Learning Theory Cluster

Bandura is usually associated with Social Learning Theory, which focuses on learning that occurs within a social context. In this view people learn from observing each other and model their behavior accordingly. Among learned behaviors are aggression and moral thinking and judgment can be learned and modified through observation. Authors in this cluster focused on individual learning and provide a

bridge between authors in the Child Development Cluster and the clusters with an organizational and societal focus.

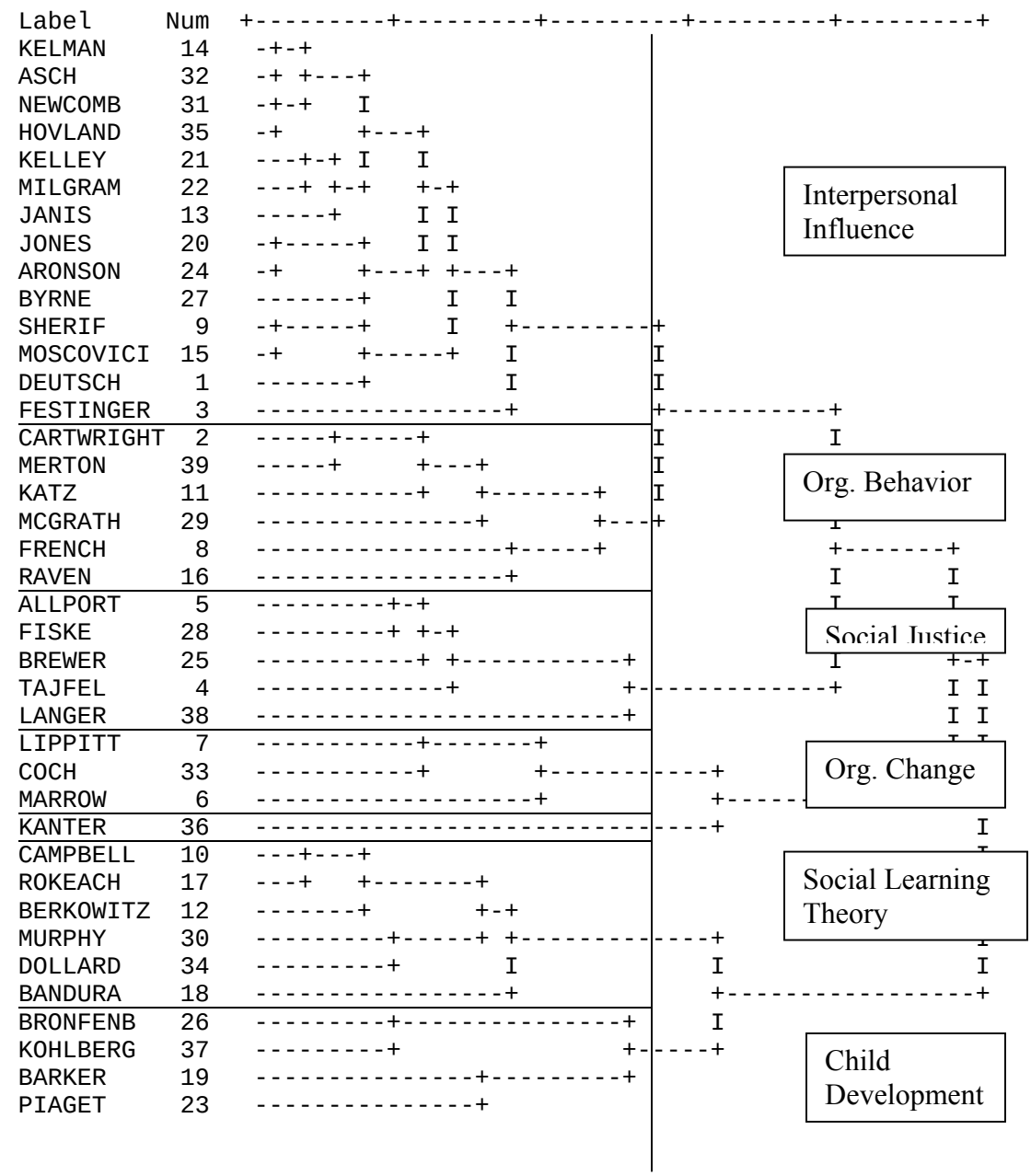
Child Development Cluster

In this cluster are four giants related to child development—Kohlberg (moral development), Piaget (cognitive development), Barker (ecological psychology), and Bronfenbrenner (comparative childrearing practices).

Isolate

Rosabeth Moss Kanter was added to the revised list along with Alfred Marrow even though they were below the minimum cocitation rate of seven. I added Kanter and Marrow in order to include as many authors from the list of 60 highly cocited authors as possible. Marrow did cluster with Lippitt and Coch but Kanter remains an isolate at the six-cluster solution. Kanter represents an interesting shift in her citation identity (White, 2000). Currently Kanter is a prominent speaker and consultant on strategic organizational management and innovation. She is a prolific author, formerly editor of the *Harvard Business Review,* and highly cited in *Human Relations* (discussed in the next chapter). Kanter was trained as a sociologist. In the *JSI* she is cited for her early book, *Men and Women of the Corporation,* which discussed communication between genders in the corporate setting. The clustering algorithm eventually joined Kanter to the Organizational Change Cluster.

Figure 6. Cluster Analysis—39 Authors Cocited with Lewin in *JSI*
Complete Linkage



Multidimensional Scaling

The results of the MDS analysis are shown in Figure 7 (below). The two-dimension solution explained 94% of the variance with a stress level of .11. Appendix G contains the stimulus coordinates used to place author names on the map. With the removal of the marginally connected authors, the right side of the original sixty-author MDS map (Figure 3) was allowed to expand and more clearly differentiate into clusters representing the range of Lewin's contributions instead of including appraisals and historical accounts. Once again, loops around author names correspond to clusters on the dendrogram immediately above.

The horizontal axis suggests a continuum from a focus on individuals (left) to a focus on the group level analysis (right). The vertical axis depicts the same continuum from theory on the top to applied research on the bottom as the 60-author map, except that in this map the content is related specifically to theory about organizations on the top and applied research about societal issues on the bottom. Thus, the authors on the top of the map wrote about fundamental issues of group structure and dynamics, while those on the bottom applied these concepts to studying prejudice and discrimination in intergroup relationships. The two authors, Kanter and Brewer, who anchor the vertical axis, exemplify this continuum. Kanter, as discussed above, is cited for her early work on gender communication in organizations while Brewer writes about gender equality in society.

Authors in four clusters from the dendrogram are arrayed close to each other around the center of the map, indicating their ties to many other names. The experimental social psychologists from the Interpersonal Influence Cluster remain

particularly near each other. On the other hand, the remaining two clusters, Child Development and Organizational Change, as well as Kanter are on the periphery of the map representing their lack of connection with the four center clusters. It appears, therefore, that authors citing Lewin in the *JSI* choose to reference work that reflects the core mission of SPSSI; namely, following Lewin's call to apply rigorous experimental research within the context of real world societal concerns.

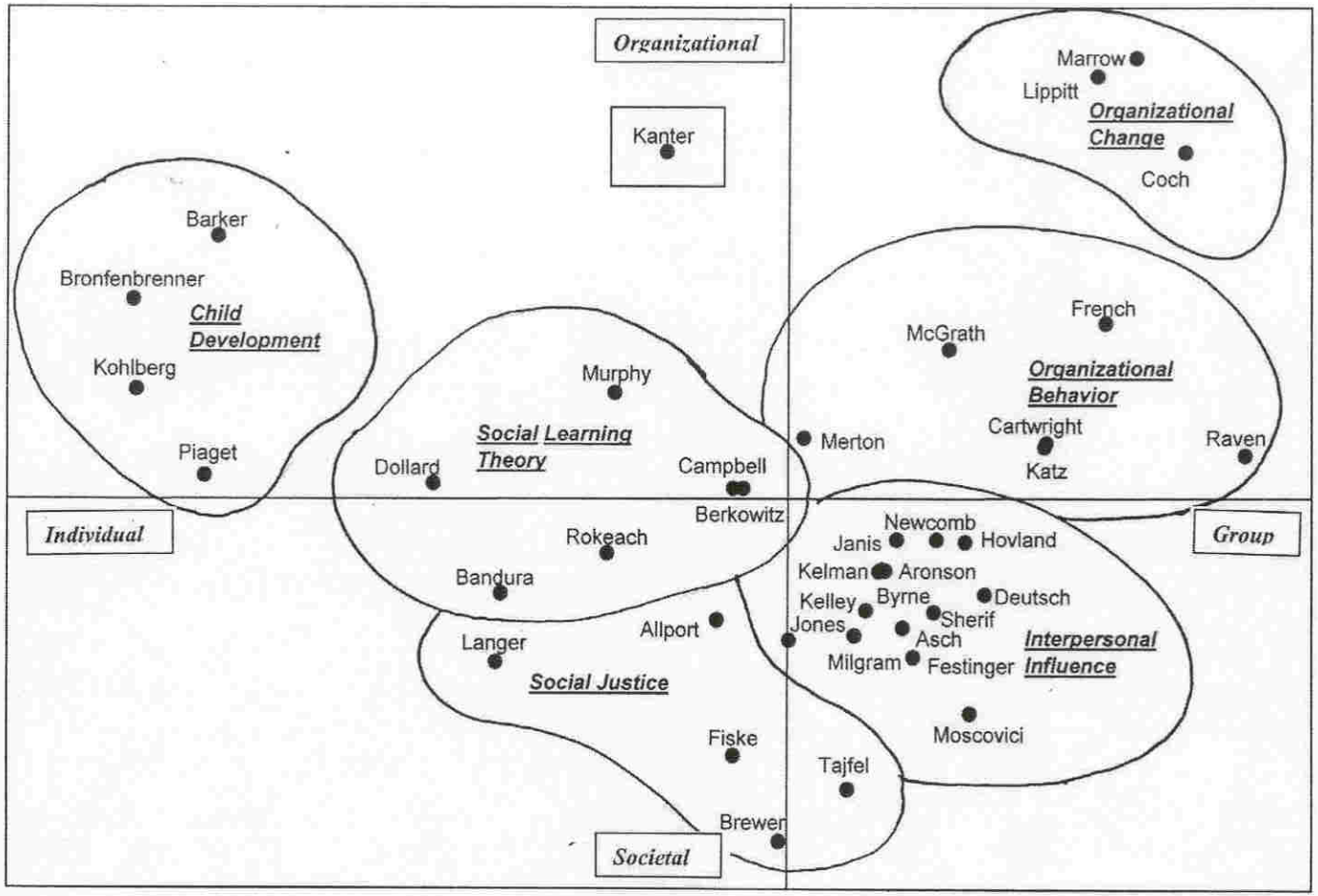


Figure 7. MDS Map—39 Authors Cocited with Kurt Lewin in *JSI*

Principal Components Analysis

The principal components analysis of the revised *JSI* author set generated six components accounting for 81% of the variance (Table 7). Component 1 Interpersonal Influence, accounts for 52% of the variance. Thirty-one of the 37 authors load above .4 on this component, which seems to largely consist of social psychologists. This component includes names from the four major clusters circled on the MDS map—Social Learning Theory, Social Justice, Interpersonal Influence, and Organizational Behavior. The authors not loading above the threshold are part of the clusters located on the far left and top right of the map. Notably, Bronfenbrenner, Barker, Piaget, Kohlberg (Child Development Cluster), Coch, Lippitt, Marrow (Organizational Change) and Kanter (isolate) do not load above .4 on Component 1.

Component 2 Child Development accounts for 11% of the variance and deals with the developmental aspects of socialization. As previously noted, the first two authors are cited for their work on comparative child rearing practices and ecological psychology respectively, Piaget is known for cognitive development, while Kohlberg wrote about moral development. Coch and Brewer are cited for their work on issues of prejudice and discrimination.

Nine group dynamics and organizational behavior scholars constitute Component 3 Organizational Behavior, which explains 8% of the variance. Katz, author of *The Social Psychology of Organizations*, joins Lippitt and Coch in loading above the threshold. Minor factors Components 4, 5 and 6, each account for small amounts of the variance. Component 4 Gender Communication (4% of the variance), with eleven authors loading above .4, is most strongly represented by Rosabeth Moss

Kanter, cited for work on communication between genders. Most of the authors loading on this component wrote about the effects of rigid and dogmatic thinking and behavior. Nine authors led by Raven and Coch load above .4 on Component 5 Organizational Change. Raven wrote about social control and Coch wrote about overcoming resistance to change in organizations. Piaget, Rokeach, Milgram, and Janis are several of the authors also loading on this factor. All these authors wrote about cognitive rigidity, inflexibility, and dogmatism.

Component 6 Social Justice with just 3% of the variance is interesting in that 27 authors load above the threshold. Most of the authors loading on this component also are included in Component 1 Interpersonal Influence. Brewer, Moscovici, Fiske, and Tajfel have the highest loading on Component 6. They are cited for their research on ameliorating prejudice and discrimination. Most of the other authors listed with this component are part of the Interpersonal Influence Cluster, concerned with conformity and group norms.

In this data set a few authors present diffuse citation images by loading above the threshold across most of the components. Merton (social structure) loading on five components is the most diffuse, which is consistent with his stature as a canonical author and one of the most highly cited social scientists. The citation images of Campbell (research design), Berkowitz (experimental social psychology), Rokeach (dogmatism), Allport (social justice) are almost as diffuse with loadings on four components. Two other authors, Langer and McGrath also load above .4 on four components. Langer is cited for writing about mindfulness, a concept related to flexible thinking and openness to new ideas. McGrath has written critically about the

consequences of current academic social psychology's retreat from addressing problems within their context. He believes that focusing on sterile laboratory experiments has led to a split between applied group work that occurs in organization studies and social psychology.

At the opposite extreme, four authors have a crystallized citation image. The authors so listed are consistent with their placements on the dendrogram and the MDS map. Bronfenbrenner (comparative child rearing), Barker (ecological psychology), Kohlberg (stages of moral developmental), and Kanter (gender communication) are each associated with a particular specialty that is not a core concern of SPSSI. Child development is of peripheral interest to SPSSI and Kanter is currently associated with management consulting.

Table 7. Structure Matrix—39 Authors Cocited with Lewin in *JSI*

	Component					
	1 Interper. Influence	2 Child Devel.	3 Org, Behavior	4 Gender Comm.	5 Org. Change	6 Social Justice
ARONSON	.946					.560
HOVLAND	.935					.475
NEWCOMB	.926					.559
ASCH	.899					.682
KELMAN	.898				.422	.628
JANIS	.882			.479		.562
MILGRAM	.878					.559
BYRNE	.875					.557
KELLEY	.866					.667
JONES	.865					.665
MERTON	.833	.459	.445	.433		.516
SHERIF	.828					.769
BERKOWITZ	.819	.493		.457		.501
DEUTSCH	.809				.401	.726
CARTWRIGHT	.795		.547		.503	.457
ALLPORT	.780			.418		.736
KATZ	.758		.613			.430
CAMPBELL	.725	.483		.587		.700
FESTINGER	.722				.420	.590
ROKEACH	.711	.596		.563		.591
MURPHY	.648	.576	.452			

Table 7. Structure Matrix—39 Authors Cocited with Lewin in *JSI (cont)*

FRENCH	.636		.539		.484	
KOHLBERG		.864				
BRONFENB		.861				
BARKER DOLLARD	.572	.809 .757		.455		
PIAGET		.713		.544		
BANDURA	.623	.685				.504
MARROW			.841			
LIPPITT			.788		.488	
KANTER				.894		
LANGER	.527	.436		.599		.478
RAVEN	.534				.846	
COCH			.555	.452	.754	
MCGRATH	.531		.507		.543	.462
BREWER	.421					.899
MOSCOVICI	.731					.878
FISKE	.649					.847
TAJFEL	.551					.815

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Table 8 (below) reports the correlation of the factors to each other. All the factors are associated above the threshold value with Component 1 Interpersonal Influence, which is a generalized social psychology component. Component 1 reflects Lewin's belief that understanding an individual requires viewing the individual within the context of their environment. Component 6 Social Justice has the strongest correlation with Component 1. Component 6 includes most of the same authors as Component 1 except that the authors most representative of this component are concerned with applied research to address social justice.

Component 4 Gender Communication displays a strong association with Components 2 Child Development and 5 Organizational Change. Although it is a minor component, nevertheless the subjects covered by these three components speak to the broad mission of SPSSI. Component 4 authors write about the effects of dogmatic and prejudiced thinking and behavior. Component 2 is associated with cognitive and moral development of children and various cultures while Component 5

deals with changing organizational thinking and behavior. The association between Components 3 and 5 seems to rest on their common focus on organizational behavior.

Table 8. Component Correlation Matrix—39 Authors Cocited with Lewin in *JSI* Values >.2

Component	1 Interper. Influence	2 Child Devel.	3 Org, Behavior	4 Gender Comm.	5 Org. Change	6 Social Justice
1	1.00	.30	.25	.28	.26	.57
2	.30	1.00		.27		
3	.25		1.00		.26	
4	.28	.27		1.00		
5	.26		.26	.25	1.00	
6	.57					1.00

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Pathfinder Network Analysis

Figure 8 displays the PFNet for the revised author set with names arranged for easier interpretation. The network was generated from the raw cocitation matrix with the row mean inserted in the diagonal and parameters set for the sparsest network (r = infinity, q =n-1). Festinger, one of the most highly cited people in psychology and one of Lewin's students, is the dominant figure in this intellectual network as seen by citing authors in *JSI*. Festinger's signature work is his influential theory of cognitive dissonance.

Bandura, French, and Sherif also have key roles in this intellectual network, though not nearly as powerful as Festinger's. On the upper right, Bandura's work on social learning theory serves as a bridge between authors such as Piaget (cognitive development), Langer (mindfulness), and Dollard (frustration and aggression) and the rest of the social psychologists. Bandura is the "gatekeeper" or link between the authors on the left side of the MDS map and the social psychologists on the right side

of the map. French, placed on the bottom of the PFNet, plays an important role in the study of power and authority and the structure of groups and group climate. Toward the upper left portion of the PFNet, Sherif connects the sub-group of writers focusing on issues of intergroup relations.

Several authors form cliques in which all the members of the clique are linked to each other. One such triad is Cartwright, French, and Festinger, who were Lewin's students. Another triad is Rokeach (dogmatism), Bandura (Social Learning Theory), and Festinger. Social Learning Theory offers a model for understanding and addressing dogmatic thinking.

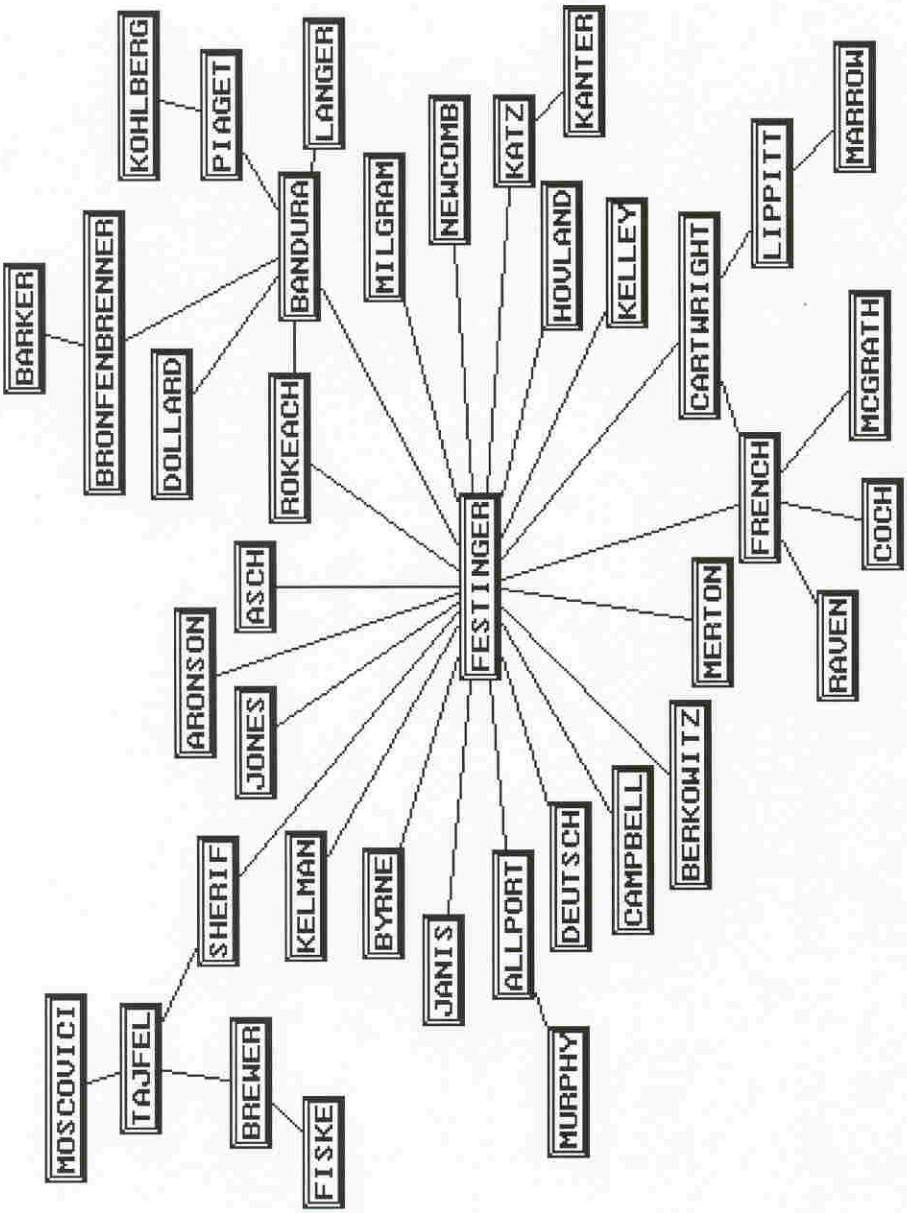


Figure 8. PFNet—39 Authors Cocited with Kurt Lewin in *Journal of Social Issues*

Figure 9 displays the Pathfinder network with main specialty loadings from the principal components analysis substituted for author names. Once again, the correspondence between the PCA loadings and the PFNet is striking. All of the authors directly connected to Festinger comprise the Interpersonal Influence specialty. Members of smaller specialty groups, such as the Child Development group, are linked to one "gatekeeper." Overall, the data set is quite homogeneous and consistent with the cluster's placement on the 60-author map.

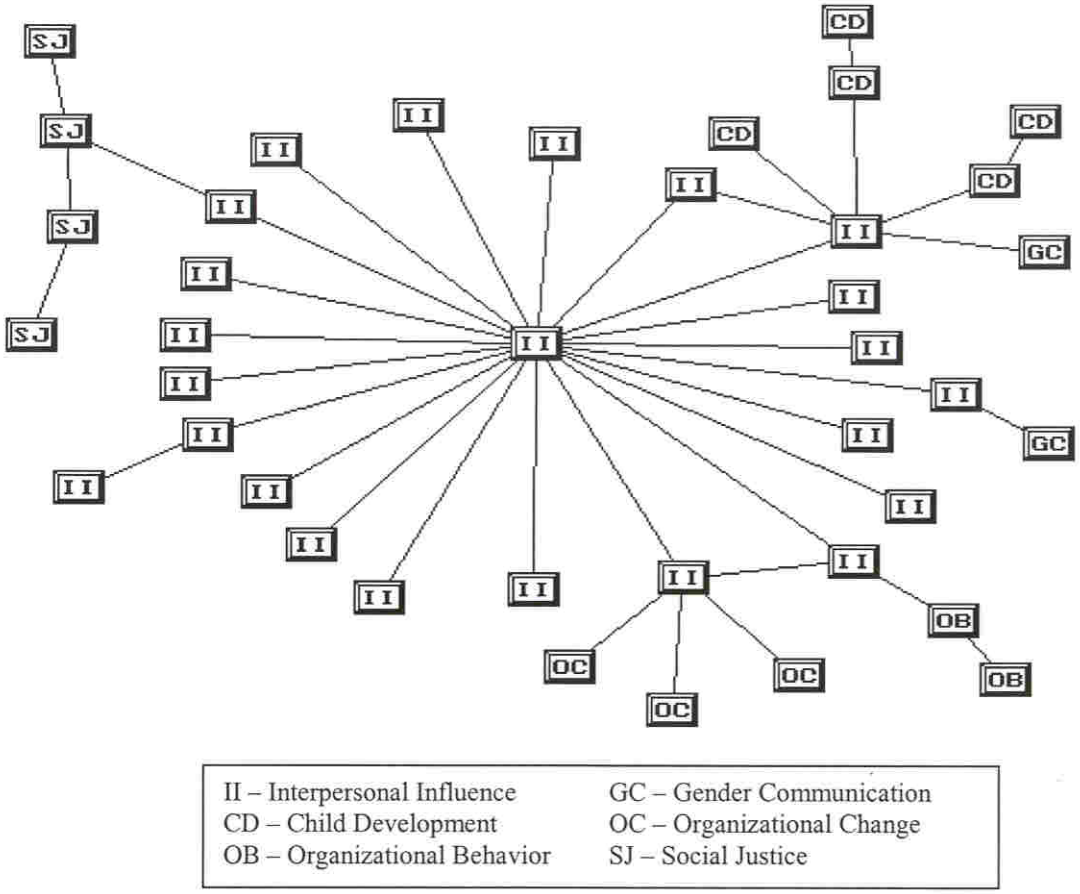


Figure 9. PFNet—Main Specialty Loadings of 39 Authors Cocited with Kurt Lewin in *Journal of Social Issues*

Summary of the author cocitation contextual analysis

The first cocitation context analysis, derived from authors cocited with Lewin in the *Journal of Social Issues,* displayed two distinct foci. The majority of authors were cited for work that expresses the range of Lewin's contributions to topics within social psychology. These authors were more likely represented in the pilot study. The other focus in the *JSI* documents was a parochial interest in the history of SPSSI, Lewin's contributions, etc. These documents tended to be historical accounts or reappraisals, a focus that was not visible in the pilot study. The network for the 60 cited author set is highly interconnected with Festinger emerging as the central figure and most of the social psychologists arrayed around him. Authors placed on the left side of the MDS map are placed around the periphery of the network. Specialty loadings applied to the PFNet in place of author names produces an excellent display of the connections among specialties.

In order to determine whether authors with low cocitation counts were distorting the results, I devised an inclusion threshold that led to a revised author set of 39 names. I then repeated the same procedures as previously with the original 60 authors. The revised author set essentially creates an in-depth view of the social psychology side of the MDS map. The subject clusters of the revised set covers the major topics that Lewin studied. The network of the revised author set reveals that Festinger remains a central figure, but Bandura and Sherif display gatekeeping roles between small groups of authors and the main social psychology group.

Using different methods to produce complementary perspectives of the data is important for enhancing meaning extracted from the data as well as to counter the

inherent shortcomings of each method. Researchers have used the "traditional" triad of cluster analysis, multidimensional scaling, and principal components analysis to good effect in numerous cocitation studies. In this research cluster analysis showed how authors with similar profiles, the social psychologists for example, grouped quickly in the clustering process. The MDS map, on the other hand, illustrates the underlying dimensions of the data and shows the great dissimilarity between the authors who wrote historical accounts about Lewin and the authors whose work related topically to Lewin's work.

Newer techniques for data analysis of cocitation data were provided by the Pathfinder network analysis. Unlike the "traditional" methods (above) that are based on a proximity matrix of cocitation occurrences, the PFNets are generated from the raw frequency cocitation counts. The initial PFNet graphs with author names revealed the dominant figures in the data set. Festinger obviously dominated both graphs. A number of other authors occupied an equally important "gatekeeper" role in connecting less dominant subjects and authors to the main network. The secondary PFNets that substituted PCA primary loadings for author names offered a clear view of how the different subject specialties were linked.

V.3. Citation Context Analysis of References to Lewin in the *Journal of Social Issues*

In this section I explain the data collection procedures and present the results obtained from the citation context analysis of the references to Lewin in 75 articles in the *Journal of Social Issues* between 1972 and 2001.

Data Collection

Two coders (a colleague and I) independently read the documents citing Lewin and assigned each article to one of three categories, (1) Research Report, (2) Review, or (3) Theoretical/Conceptual, using the criteria described in Chapter IV Research Design. Each reference to Lewin was coded separately and classed as either Totemic or Substantive according to the criteria outlined in Chapter IV. My colleague and I conducted a small pilot study of references to Lewin in nineteen articles so that we might assess the viability of the coding scheme and our interpretation of the references. After discussing our assignments and being satisfied that we were generally interpreting the categories and classes in a similar way, we proceeded to code the remainder of the references. Our assignment of articles to categories and citations to classes agreed 80% of the time. When our coding choices conflicted, we reviewed the relevant passage or article and arrived at a mutually agreeable solution.

Some articles contained multiple references to Lewin, which resulted in the number of references outnumbering the number of articles. The total number of references to Lewin is 218. All data were assembled in Excel spreadsheets for examination.

Analysis of Citation Context

Table 9 shows a breakdown of citations by type of article. A chi square test for an association between article class and citation category was not significant (p=.785). Although the results were not significant a large percentage of articles was assigned to the Theoretical /Conceptual category (41%). Most of the Theoretical/Conceptual papers offered a "framework" or "model" for considering a topic in a "new" or "different" perspective. At the same time, many of the authors wrote explicitly within a Lewinian framework and often made Substantive citations to Lewin's work. The authors of articles in this category often discussed a program of research they conducted that was the background for the theory described in the article. This differs from articles in the Research Reports category where the focus of the article was reporting the results of current research. Recipients of the Kurt Lewin Award, which is given annually by SPSSI to a person who exemplifies Lewin's commitment to social justice, wrote some of the articles in the Theoretical/Conceptual group.

The Review category (36%) contained articles that discuss topics such as social psychological issues in sex discrimination. Research Reports (23%) constituted a surprisingly small percentage of the articles citing Lewin. *JSI* is devoted to action research and to implementing Lewin's dictum about combining rigorous research within a real world context, which would lead to a larger number of articles in this category than was actually observed. It is possible that authors of research reports did not, in general, cite Lewin, which could be confirmed by analyzing all or at least a substantial sample of the articles in the *JSI*.

Table 9. Classification of Articles Citing Lewin in *Journal of Social Issues*

	Document Class			
Citation Category	Review	Research Report	Theoretical/ Conceptual	Total
Totemic	31.0%	25.0%	30.5%	29.8%
Substantive	69.0%	75.0%	69.5%	70.2%
Total # citations	87	36	95	218

Table 10 displays the totals for articles citing Lewin by the article's publication year. The 1982-86 period included the previously mentioned issue celebrating the fiftieth anniversary of SPSSI. The 1992-96 period includes the issue organized around the title "The Heritage of Kurt Lewin." Judging by the number of articles published citing Lewin, there was a large increase of interest in Lewin from the 1980s on. It may be that various anniversaries sparked an increase in citations to Lewin. For example, Gold's edition of *The Complete Social Scientist: A Kurt Lewin Reader* (1999) was dedicated to the fiftieth anniversary of the Institute for Social Relations at the University of Michigan.

Table 10. Number of Articles Citing Lewin in *JSI*

	Publication Years					
	1972-76	1977-81	1982-86	1987-91	1992-96	1997-01
No of articles	7 (9.3%)	4 (5.3%)	10 (13.3%)	17 (22.7%)	24 (32%)	13 (17.3%)

Figure 10 (below) illustrates the number of Totemic and Substantive citations in each of the three document categories. Although the percentage of Substantive citations (71%) was over two times greater than the number of Totemic citations (28%), there was considerable variation in the proportion of Totemic and Substantive citations assigned to the three document types. Reviews and Theoretical/Conceptual

categories had almost identical profiles in their number of Totemic and Substantive citations. The preponderance of Substantive citations was consistent with Lewin's purported role in SPSSI. The relatively large number of Substantive citations in the Research Report class was somewhat surprising. Research Reports tend to include a small literature review that briefly mentions the major work relevant to the current study; therefore, one might expect the citations in the Research Reports in this study to have a greater number of Totemic citations. Instead authors writing this type of article use Lewin's concepts and research results in a substantive way.

Eight Theoretical/Conceptual articles contained both Substantive and Totemic citations. Surprisingly, only two Review articles contained both Totemic and Substantive citations. When writers made Substantive citations, they were also likely to make explicit reference to Lewin's ideas without a formal citation. An example is, "We defined social power as 'potential influence,' which we should note was very similar to Lewin's—'the possibility of inducing forces'." Many of the documents that contained a Totemic citation included only one citation to Lewin, indicating an acknowledgement of similar work being done or Lewin as the originator of an idea, similar to the use described by previous research.

Figure 10. Comparison of Citation Class and Document Category in *JSI*

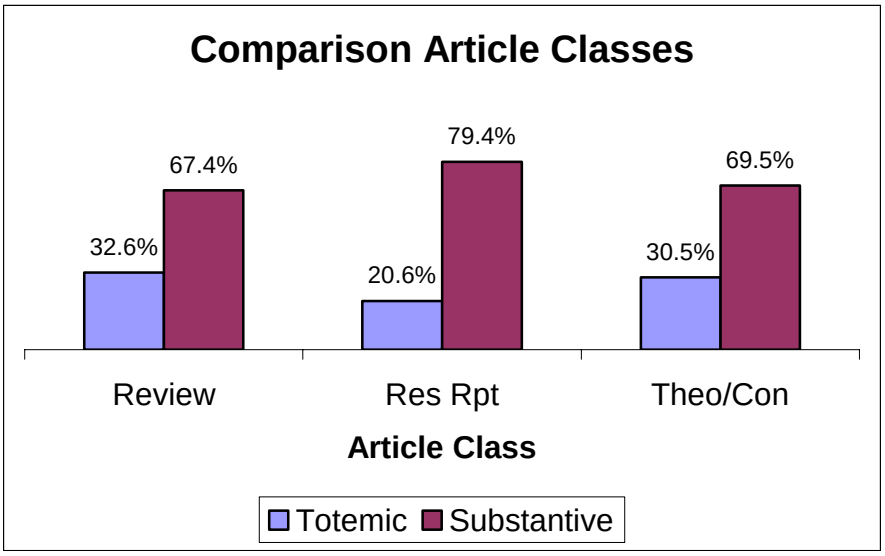
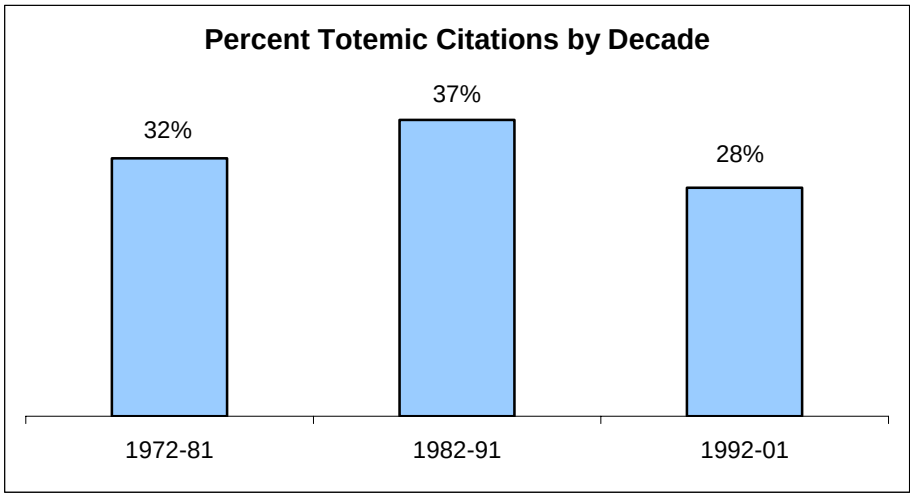


Figure 11 represents the percentage of Totemic citations present in the document set over the three decades covered in this study. The percentages listed in each column represent the amount of that decade's total citations classed as Totemic. In the first decade studied Totemic citations accounted for almost a third of the total. That proportion increased somewhat during the second decade to over a third of the citations. During 1992-01 the amount of Totemic citations dropped to just over a quarter of the total. The expectations that citations to Lewin would become increasingly Totemic over time and that the number of references to Lewin would decrease over time are not met.

Figure 11. Change in Citation Function in *JSI* over Time



The immediate question that arises is why different results were obtained for this journal than the results obtained from previous research. Although there is no definitive answer at this time one can speculate on several characteristics of this journal and of the research design that might influence the results. First, the definition of Totemic citation is a crucial feature since that determines the assignment of a citation to a class. Hargens (2000) noted that a common pattern of totemic citations was they occurred as part of a string of at least three similarly constructed citations. My definition of Totemic citation was a blend of the McCain & Turner definition of peripheral citation and the Hargens definition. Although it seemed to cover essential features of both previously useful definitions perhaps my definition was in practice quite different from the previous researchers' definitions. Another feature of the research design that might skew the results is that I coded each citation to Lewin. It was not systematically examined but one observation is that Totemic citations seemed likely to occur less frequently in an article while several Substantive citations may occur in a given article.

The characteristics of the journal and the articles citing Lewin may also be an important reason for the unexpected results. *JSI* did not publish as many research reports citing Lewin as they did other types of articles. Research reports generally have a brief literature review in which previous work is acknowledged but not discussed at length and may lend themselves more easily to totemic citations. Many of the articles citing Lewin were less formulaic than the standard research report that McCain & Turner (1989) found in their research. Although some psychology journals do focus on research reports and tend to follow a standard format, *JSI* articles citing Lewin did not. A brief examination of articles that did not cite Lewin, however, did not suggest that this variety of format was confined to authors citing Lewin. There is a rather wide range of types and length of articles in *JSI*. One way to test whether totemic citations to Lewin occur more widely is to conduct a similar analysis of a journal, such the *Journal of Personality and Social Psychology* which contains a sizable number of references to Lewin but tends to publish articles that follow a rigid research report format.

Another possible reason that results of this citation context analysis differ from results of previous research is that the small data set is vulnerable to variation unlikely to affect larger data sets. By this I refer to the *JSI* anniversary issues in which Lewin figured prominently. Although the information obtained from including these articles is likely to be helpful in understanding the relationships among citing and cited authors and the structure of SPSSI, it is reasonable to suggest that authors publishing articles celebrating the historical importance of SPSSI and Lewin are likely to use Lewin's work in a substantive way. Conducting an analysis that

compares articles that do not cite Lewin to these results would establish some context for understanding the results for this journal.

Another possible explanation for these results is that Lewin's work is Lewin's work has found new outlets so that he is becoming fashionable again, if his work is increasingly used substantively over time. One way to determine that is to conduct an analysis over a longer time to observe what the circumstances of citations to Lewin's work were in the interval between his death in 1947 and 1972 when this study began. The results of the pilot study suggested that indeed, as new authors entered the field Lewin's citations increased over time and his ideas migrated to new specialties. As discussed in previous chapters some of Lewin's theoretical formulations were radically different when he first proposed them but have become generally accepted.

Cited Works and Cited Concepts

In this section I discuss Lewin's most frequently cited works and most frequently cited concepts used by authors in this study.[9] In the Foreword to *Resolving Social Conflicts* (1948), Gordon Allport explains that Lewin's "explanatory concepts" can be divided into three types. (See Table 11 below.) Some concepts, such as "life space," "region," and "space of free movement," are derived from topology. Topology is a branch of geometry that treats spatial relationships without considering quantitative measurement. The second category of concepts springs from dynamic individual psychology and the model of systems of tension within the individual. Concepts in this group include "need," "aspiration level," and "satiation."

[9] The reader is referred to Appendix E for a detailed explanation of the context of Lewin's theories and research.

Lewin introduced the third class of concepts, "field forces," in order to integrate the individual's tension system with the influence of the surrounding environment. Such concepts include "force field," referring to motives dependent on group pressure, "barriers" are obstacles to individual action because of environmental pressures, and "locomotion" induces changing one's position with reference to the group (Allport, 1948, p.6). "Valence" is the attraction to or repulsion from a goal. Although these components of Lewin's theory were developed over time, the whole is usually called "Field Theory." Additionally, because these aspects of Lewin's theory were published in various journals and multiple reprints of collected papers, authors citing Lewin refer to a number of different works for the same concepts. This problem was particularly acute in Lewin's second most highly cited work, *Field Theory in Social Science* (discussed below).

Table 11. Lewin's Explanatory Concepts from Allport (1948)

TOPOLOGY	INDIVIDUAL DYNAMICS	FIELD FORCES
Life space	Need	Barriers
Region	Tension system	Locomotion
Freedom of movement	Aspiration	Valence

Lewin's most frequently cited work in the *Journal of Social Issues* was *Resolving Social Conflicts* (1948). This anthology reflects (1) Lewin's work as an applied psychologist interested in the origin and dynamics of social injustice and conflicts and (2) his efforts to develop methods for preventing and solving such problems. The material in this book expresses the mission of SPSSI—to use action

research to ameliorate social inequalities and the effects of bias and discrimination in American society.

This volume was originally published after Lewin's death with his wife, Gertrud Weiss Lewin, serving as editor. It subsequently went out of print. The American Psychological Association (APA) reprinted *Resolving Social Conflicts* in 1997, combining it in a single volume with *Field Theory in Social Science*. The APA publisher, Gary VandenBos, said APA's goal in bringing the two titles together was "to familiarize readers with the broad range of Lewin's thinking and to stimulate renewed interest among contemporary scholars in Lewin's work" (p. v).

Resolving Social Conflicts reprints thirteen articles that were published in various journals between 1935 and 1946. In his Foreword to the 1948 edition Gordon Allport said that the goal for publishing the book was to provide:

> an excellent introduction to Lewin's system of thought. To be sure, the selection has a social emphasis, and some of the concepts central to his system are not here fully developed. To understand field theory completely the reader will wish to refer to Lewin's other writings. Yet this volume succeeds in conveying his conviction that theories to be worth their salt must be tested in action, and his conviction that the social ground of mental life must be considered in virtually every psychological act (p. 9).

The second most frequently cited Lewin's work in the *JSI* is *Field Theory in Social Science: Selected Theoretical Papers* (1951), edited by Dorwin Cartwright. Cartwright was Lewin's student and the first Director of the Center for Group Dynamics at the University of Michigan. He also appeared on the list of authors cocited with Lewin in the *JSI*. This anthology went out of print, was reissued in 1976,

and again went out of print until 1997, when the APA reprinted *Field Theory* and *Resolving Social Conflicts* in a single volume.

In *Field Theory* Lewin describes the methodological and conceptual tools needed to construct a scientific system for understanding man and society. *Field Theory* contains ten of Lewin's papers, ranging from the 1939 paper in the *American Journal of Sociology* to the 1947 articles in the inaugural issue of *Human Relations.* The 1939 paper describes the overlapping concerns of sociology and of experimental psychology and the benefits of cooperation between the two disciplines. The *Human Relations* articles, published posthumously, summarize some critical experiments in leadership style and in changing food buying habits.

In the original 1951 edition of *Field Theory,* Dorwin Cartwright explains that because Lewin's work is scattered through several journals, monographs, and his Presidential Address for SPSSI, certain concepts are repeatedly presented and discussed. Consequently, Cartwright edited parts of some papers in order to present a coherent whole that was not repetitious. For example, Chapter 8, "Psychological Ecology (1943)," presents Lewin's theory of "social channels." Lewin presented this theory in three separate places as he developed it. Cartwright solved the coherence problem by combining sections from "Forces behind food habits and methods of change" (1943) (an outgrowth of Lewin's work with Margaret Mead) with sections from "Constructs in psychology and psychological ecology" (1944) and from "Frontiers in Group Dynamics II" (1947).

Field Theory consists of ten chapters that Cartwright divided into three parts. In the first part of the book, three papers present several basic problems in the

philosophy of science and establish "guiding principles" that are applied to specific problems in the following six chapters. These six chapters demonstrate applications in the fields of learning, development and regression, social psychology and group dynamics, and selected problems in cultural anthropology, sociology and economics. The last chapter summarizes the major findings from research conducted under Lewin's immediate supervision (1997, p. 166).

Lewin defined the essential characteristics of Field Theory in "Field theory and learning" (1942) as: "the use of constructive rather than classificatory method, an interest in the dynamic aspects of events, a psychological rather than a physical approach, an analysis which starts with the situations as a whole, a distinction between systematic and historical problems, a mathematical representation of the field" (1997, p. 212). *Field Theory* contains most of the highly cited concepts used by authors citing Lewin in the *JSI*. *Field Theory* actually amplifies, integrates, and replaces two earlier works, *Dynamic Theory of Personality* (1935) and *Principles of Topological Psychology* (1936), the third and fifth most highly cited works respectively in the *JSI* data set.

These latter two works are generally agreed to be difficult reading for several reasons. First, they were written in German and translated by Lewin's colleagues and friends but retained some of the dense prose of the original. Second, the material presented in the books is theoretical and alien to readers unfamiliar with topology and Gestalt psychology. Allport, in the Foreword to *Resolving Social Conflicts,* acknowledges the "advanced level" of *Dynamic Theory of Personality* and *Principles*

of Topological Psychology. One goal of both *Resolving Social Conflicts* and *Field Theory* is to make Lewin's work more accessible.

Dynamic Theory of Personality, a collection of his most important articles from his Berlin years, were collected and translated by Donald Adams and Karl Zener. These articles establish Lewin's model for individual psychology, which was expanded in later works. In *Principles of Topological Psychology* Lewin openly broke with the Berlin Gestalt group by laying out his interest solely in the psychological field. The book consists of two parts in which Lewin first provides an introduction to mathematical terms and topology and then presents topological psychology. Lewin later discarded the term "topology" in favor of "Field Theory."

Lewin's article (with Lippitt and White), "Patterns of aggressive behavior in experimentally created social climates" in the *Journal of Social Psychology* (1939) is also frequently cited and also contains material replicated in several other places. This article describes the famous experiments with three leadership styles—democratic, authoritarian, and laissez faire. According to Gold (1999), these studies illustrated the innovative use of experimental method in several ways. First, the experiments were conducted with "real" groups, in the sense that, as far as the participants were concerned, the groups existed for purposes other than the experiments. Second, the experimental conditions were systematically manipulated for research purposes. Finally, Lewin and his students operationalized and manipulated (varied ad independent variables) heretofore theoretical concepts of "democratic" and "autocratic" modes of leadership.

The most frequently occurring concepts in the articles citing Lewin in the *JSI* was "action research" and "field theory." This was congruent with the most frequently cited works, *Resolving Social Conflicts* and *Field Theory*. Terms related to action research refer to "methods of social change" and "resolving social conflict." A number of terms that are part of Field Theory were frequently mentioned, such as "life space," "force field", and "psychological ecology."

Components of group dynamics that also appeared included "group process," "group climate," and "group decision as change technique, " Lewin's three phase model for changing group behavior—"unfreezing, change, and refreezing," and "quasi-stationary equilibrium."

Authors referencing the 1939 Lewin, Lippitt and White paper on leadership style mentioned such terms as "democratic leadership," "democratic structure," "small group and laboratory study," and "group leadership style." Table 12 displays the most frequently cited Lewinian concepts in the *JSI.*

Table 12. Frequently Cited Lewinian Concepts in *JSI*

ACTION RESEARCH	GROUP DYNAMICS	FIELD THEORY
Methods of social change	Group process	Life space
Democratic & authoritarian leadership style	Group climate	Force field
Resolving social conflict	Group decision as change technique	Psychological ecology
	Unfreezing, refreezing	
	Quasi-stationary equilibrium	
	Small group & laboratory study	
	Group leadership style	

Summary of the citation context analysis

The results of the citation context analysis are contrary to expectation in several ways. Although there was no significant association between type of article and citation category, there was a large difference in the amount of Totemic and Substantive citations in the data set. The breakdown of articles by category reveals that 41% of the authors citing Lewin wrote Theoretical/Conceptual articles. Reviews accounted for 36% and Research Reports totaled only 23% of the documents. The number of articles citing Lewin rose over the time studied, which may reflect several anniversaries occurring during the time studied. The proportion of Substantive and Totemic citations for the three article classes is overwhelmingly composed of Substantive citations. The use of Lewin's work increases over time. The proportion of Totemic citations did not steadily increase over the three decades studied.

Authors citing Lewin in the *Journal of Social Issues* between 1972 and 2001 most frequently cited concepts from two works, *Resolving Social Conflicts* and *Field Theory,* which presented the most complete exposition of Lewin's theory and research at the time of his death. Lewin's theories developed over time and concepts, at times, appeared in several papers or anthologies. In addition, papers and anthologies were reprinted. Two earlier works, *Dynamic Theory of Personality* and *Principles of Topological Psychology* were cited much less frequently. The most frequently cited concepts in the data set are convergent with the goals of SPSSI—action research in groups. The same can be said of the uses citing authors made of Lewin's work; that is, authors particularly chose those concepts that express the topics of most concern to SPSSI. The status accorded Lewin in the organization can

be seen as a reflection of the congruence between ideas espoused by SPSSI and Lewin's research agenda.

V.4. Congruence with Published Literature

This section discusses whether and how the results of the author cocitation and the analysis of citation function reported previously corresponded with published accounts of Lewin's influence. Writers differ in their assessment of Lewin's legacy. The Society for the Psychological Study of Social Issues (SPSSI) indicates its view of Lewin. Various commentators, from Lewin's students and colleagues to authors of texts and encyclopedias, have expressed a range of opinions. Do the results above shed light on the conflicting assessments?

SPSSI makes its views of Lewin's importance visible in several ways. Lewin's dictum that "nothing is as practical as a good theory" appears prominently on the Society's web page. SPSSI sponsors the Kurt Lewin Award annually and publishes the awardee's address in the *Journal of Social Issues*. Oskamp's comment likening Lewin to George Washington that was published in the introduction to the special issue of *JSI* commemorating Lewin is striking for the iconic status accorded Lewin. Lewin is one of the most frequently cited authors in the *JSI*.

The results of the analysis of citation function dovetailed quite well with the published indications of Lewin's value to the organization. First, Lewin continues to be cited over time in the *JSI*. Further, the citations were Substantive, indicating that authors used Lewin's work as an important basis for their work. Almost half the articles citing Lewin presented the citing author's theoretical or conceptual

framework. Apparently Lewin's work is still relevant for authors who are creating their own models for research.

The status accorded Lewin in the organization can be interpreted as a reflection of the congruence between ideas espoused by SPSSI and Lewin's research agenda. The author cocitation context analysis revealed that the subject content of the cocitation clusters mirrors the published research interests of *JSI*. *JSI's* scope notes clearly state the editors' preference for work that is related to action research on social issues. Both the initial cocitation map and the revised map display a range of topics. The initial map illustrates the importance of social psychology, social justice, and child development to authors citing Lewin. The former two topics directly correspond to the mission of SPSSI. The third topic reflects an interest in preventing and/or addressing the consequences of injustice and discrimination. The initial cocitation map also illustrates a focus of citing authors on the history of SPSSI and appraisals of Lewin's work, which leads to a nuanced picture of intellectual structure. By this I mean that important topics for SPSSI are picked up by the author cocitation context analysis. The revised cocitation map expanded half the initial cocitation map and offered an expanded view of topics and authors whose work corresponds to Lewin's research.

The results reported earlier in this chapter are at odds with some of the published accounts. In previous chapters Festinger, Lewin's student and himself one of the most highly cited psychologists, claimed that Lewin is hardly cited in recent decades. The results of the pilot study proved Festinger wrong since Lewin continues to be highly cited. Similarly, Graumann (2002) asserts that Lewin is not very important in

contemporary psychology. This view seems to reflect the diversity of specialties in contemporary psychology. Most psychology programs include a course on history and systems in psychology so students are exposed to Lewin at least as a historical figure. Beyond that, however, exposure to Lewin seems to coincide with the specialty studied and the department when the student studies. For example, the Institute for Social Research at the University of Michigan remains a location where Lewin's work resonates, judging from the addresses of authors citing Lewin in the *JSI*.

Another view expressed by authors, such as Deutsch (1968) is that Lewin's ideas have been incorporated into mainstream psychology and therefore, Lewin is not cited. That seems to be the case for some of Lewin's ideas. Not all of Lewin's work is cited; in fact, only some of his most well known research is visible in the *JSI*. As might be expected, the work cited is consistent with the subjects of interests to the editors as gatekeepers of the journal.

One important point to note is that Lewin's work is useful to other fields besides psychology. The pilot study revealed that Lewin is frequently cited with authors in Organization Studies (discussed further in the next chapter). A recent introductory textbook in social psychology devotes a chapter to group studies. The author ties "Lewin's classic findings" to contemporary topics, such workplace teams, study circles, and community-based organizations (Carr, 2003).

As was discussed in the intellectual biography appended to this report Lewin was never revered throughout psychology. Jones (1993), in a lengthy history of Social Psychology, dissects the Behaviorists' fear that Lewin (and Social Psychology) strayed into non-scientific theory and methods. He defends the importance of

laboratory experiments to Social Psychology. Jones also discusses research by social psychologists into social problems, such as the impact of television violence crowding and stress, health and medicine. He also points to SPSSI as an outlet for social psychologists involved in contemporary social problems. Some commentators observe that Social Psychology has evolved into a laboratory-based discipline that has largely lost its former association with the real-world action focus promoted by Lewin and others of his generation (Ford, 1999; McGrath, 1997).

Mullins used the specialty of Small Group Research as an example of a specialty in sociology that died from lack of leadership after Lewin's death. Mullins refers to the lack of *sociology* doctoral students working with small group researchers as one factor in the demise of the specialty. He points out, however, that *psychology* doctoral students may have worked with members of the specialty, which clearly is the case. The cocitation maps reveal that the small group studies conducted by Lewin and his students are still cited but that subject has evolved and migrated to a different intellectual home. Organization Studies is an example of a new discipline that finds Lewin's work relevant, especially some findings from small group research. Mullins also pointed to the applied nature of much of the small group research as another factor in the failure of Small Group Research to develop into a specialty in sociology. Applied research, nevertheless, was one of Lewin's major goals, a goal that is consistent with the aim of SPSSI.

Using a contextual filter to generate a Lewinian map of intellectual structure and to analyze citation function for the *JSI* provides a portrait that is consistent with the published accounts of Lewin's influence in that micro-environment. It does not

provide evidence to address most of the more general claims. The pilot study was useful in that regard. SPSSI appears to be a "Lewinian tribe" that uses Lewin as an organizing figure for the organization. A number of the citing authors indicated their genealogical relationship with Lewin. Several authors remarked on their intellectual heritage by labeling themselves "Lewinian." In that sense, Lewin is a totem for SPSSI and the *JSI*. When citing Lewin's work, however, citing authors used Lewin's work differently than the definition of totemic use in this research. Perhaps in this case Lewin's function as a totem is much stronger than might be seen in other journals. In the next chapter I report the results of analysis of articles citing Lewin in a different journal, *Human Relations,* which provides an opportunity for comparison.

VI. LEWINIAN INTELLECTUAL STRUCTURE IN *HUMAN RELATIONS*

VI.1. Introduction

This chapter presents the results of the data collection and analyses of an ACCA and citation context analysis of *Human Relations.* I briefly review the procedures used to arrive at the solution for mapping the intellectual structure of the data set of the sixty authors most highly frequently cocited with Lewin between 1972 and 2001. I then discuss the groups created by the cluster analysis, the dimensions of the MDS map, the results of the factor analysis, and the Pathfinder network analysis. After presenting the results of the author cocitation context analysis, I report the results of the citation context analysis. I duplicate the procedures described in the previous chapter for the analysis of the *Journal of Social Issues.*

The results of the procedures reported consistent themes. An emphasis on organization studies and action research was reflected in Lewin being cited for his substantial contributions to organization studies, which is closely associated with group dynamics. Organizational Development, Management Theory, and Workplace Issues were the major content areas for the data set. *HR's* original theoretical bases in psychoanalysis and sociotechnical systems were visible in other clusters of authors. Some authors that appeared in the *JSI* data set are also included here but the journals had two very different research interests. When I followed the same protocol of testing inclusion thresholds to eliminate authors with very low cocitation counts, the result was that the 15 authors dropped were those on the periphery of the map. This outcome dovetailed with expectation. The excluded authors represented some of the

founders of the Tavistock Institute and their research while contemporary authors with an organization focus were more visible.

VI.2. Lewinian Author Cocitation Context Analysis of Human Relations

Data collection

Lewin was cited in 122 documents in *Human Relations* from 1972 to 2001. I ranked cited authors in this set of documents by cited author using Dialog's RANK command. Cocitation context data were collected for the top sixty authors cocited with Lewin (Table 11); that is, each pair of names was ANDED with "Lewin K" in the Social SciSearch database in Dialog (File 7) between 1972 and 2001. The syntax took the following form: S CA=Lewin K and CA=Weick KE and CA=Argyris C and PY=1972:2001. The raw co-occurrence counts are assembled in an Excel spreadsheet as a square matrix of 60 by 60 cells. Although the matrix listed only the 60 authors cocited with Lewin and does not mention Lewin, the reader needs to remember that, in fact, each author name represented himself /herself paired with Lewin.

Matrix diagonal cell values

As noted earlier, the choice of values for the matrix diagonal values can vary according to the requirements of the multivariate data analysis procedure employed by the researcher. I used the row means in the diagonal for the cluster analysis, multidimensional scaling, factor analysis, and the PFNet procedures.

Converting co-occurrence data to proximities

I converted the raw co-occurrence matrix to a proximity matrix by using SPSS PROXIMITIES (Pearson's product-moment correlation coefficient). A proximities matrix was the input for the multivariate procedures of cluster analysis (SPSS CLUSTER), multidimensional scaling (SPSS ALSCAL), and principal components analysis (SPSS FACTOR).

Cluster analysis

The proximities matrix was used for the multivariate procedures of cluster analysis (SPSS CLUSTER). Appendix B contains the command syntax employed to execute this routine[10]. One useful output of SPSS CLUSTER is a dendrogram. I employed the hierarchical agglomerative approach with complete linkage. Figure 12 displays the dendrogram for the 60-author name set. The vertical black line indicates the stage in the agglomerative process where the six-cluster model is represented. The bold horizontal lines separate the clusters, with cluster labels located to the right of the vertical line. The cluster labels represent my reading of the passages that cited the authors in the articles and my consultation with a subject expert.

The overall configuration of the dendrogram shows an array of six coherent groups with authors linked by the similarity of their cocitation proximity profiles. As discussed in the previous chapters, the choice of this agglomerative approach (complete linkage) leads to maximum homogeneity within groups and maximum heterogeneity between groups. Authors with the most similar profiles are linked early

[10] The syntax referred to here and for other procedures is that used for the *JSI* except that the names are those from *HR*.

with the authors at the top of the dendrogram gradually joining with clusters further down on the list. The last link is formed when the unit formed by the top two clusters joins the cluster formed by the bottom four clusters. No authors are isolates (belonging to no cluster at the line dividing the clusters) but Bion was linked last with the graph indicating that his profile had the least similarity to the rest of the authors. Ashby and Kuhn were next to Bion in joining a cluster late in the process. These authors will be discussed below.

Overall, Lewin was cited with authors representing the spectrum of topics published in *HR*. While topics related to business and organizations appeared most frequently, especially in recent decades, *Human Relations* also publishes interdisciplinary analyses of social systems. Lewin developed and empirically tested several theories that are central to the work reported in *HR*. The first was the well-known leadership study by Lewin, Lippitt, and White that demonstrated experimentally induced changes in group behavior by manipulating the leader's style according to democratic, authoritarian, or laissez faire leadership characteristics. The second theory Lewin developed relevant to *HR* concerns was a stage model for planned group and organizational change comprised of three stages—unfreezing, change, and refreezing. The clusters are as follows.

Management Theory Cluster

The first and largest cluster represents authors writing about a range of topics related to managing and changing organizations, especially businesses. Lewin is recognized as the "chief conceptual figure" in change agent studies (Ottaway,

1983).These authors write about topics such as management (Mintzberg), strategic change and innovation (Kanter), (power and influence in leadership (Pfeffer), and organizational learning (Weick). Many of the authors are associated with management consulting and business schools, such as Kanter at Harvard Business School where she served for a time as editor of the Harvard Business Review.

One significant stream of articles published in *HR* that cited Lewin deals with aspects of organizations, both theoretical and applied. Some of the most prominent authors in organization studies include March and Simon, who wrote an important text on organizations. Katz is also cited for his book, *The Social Psychology of Organizations*. While authors in this cluster share a focus on organization consultation and development with authors in the next cluster, this first group was cited for theoretical works, such as Argyris' model "double loop learning." Argyris, a winner of SPSSI's Kurt Lewin Award, is recognized for his work on action science (action research) and organizational learning. Perrow investigated the social side of technological risk.

Organizational Development

Authors in this cluster are classic organizational development authors, whose model of working with organizations is interactive, humanistic, and hands-on. According to Ottaway (1983), the organizational development literature has reflected a preponderance of concern about the organizational development process from a macro perspective, This is an outgrowth of Lewin's (1951) three-phase model of unfreezing, moving, and refreezing which was elaborated by Lippitt and then Schein.

Bennis and Blake discussed the role of the consultant in the change process. Schein is famous for his work on organizational culture and learning. Schein's acknowledgement of Lewin's pervasive and profound influence on his own work was quoted in an earlier chapter.

Lewin recognized that the role of the leader is crucial to the process of change in improving group life (Marrow, 1969). Leadership is an important topic in the articles citing Lewin and for *HR* generally. Fiedler and many others wrote about leadership.

Action Research and Systems Theory Cluster

The third cluster is comprised of eight authors who were instrumental in founding the Tavistock Institute and who published seminal reports of action research. Some of these founders, such as Trist, describe themselves as Lewinians and as deeply influenced by a personal relationship with Lewin. Examples of this group's work include: (a) Emery and Trist's development of concepts for investigating and changing sociotechnical systems, (b) Herbst's introduction of the network perspective, and (c) Rice's influence on the A.K. Rice Institute for Human Relations Training. Lawrence's specialty was socio-economics, applied research that evaluated technical and institutional options for farmers in West Africa. The founders of Tavistock built on their original psychoanalytic orientation, expanding it with a living or open systems perspective. Miller, who wrote about systems of organization, was a psychoanalyst and a major figure in the development of open systems theory.

Workplace Issues Cluster

This cluster includes authors associated with industrial psychology who wrote about job characteristics, employee motivation, and effective work teams. The emphasis of these authors' work is on the individual in the workplace, in contrast to the cluster above, which primarily focused on the organization, especially from a management perspective. Hackman developed the "Job Diagnostic Survey" that measured core job characteristics. Hackman, Lawler, and Porter co-authored several articles and book chapters, which looked at task and work design, dynamics and performance of work teams. Vroom (Vroom-Yetton Model for Decision Making) and Locke (Goal Setting Theory) focused on motivational mechanisms and participative leadership and their effect on performance.

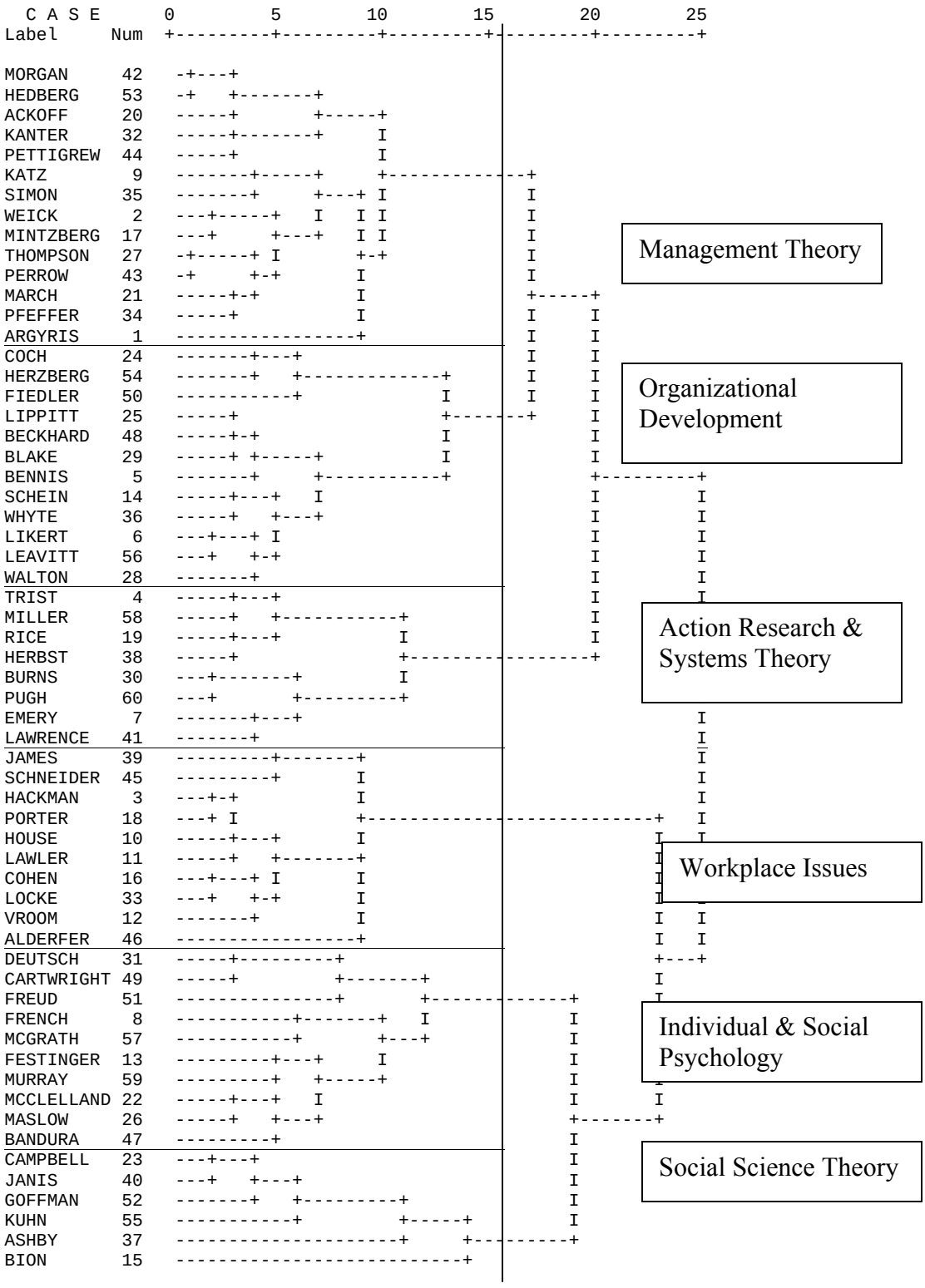
Individual and Social Psychology Cluster

Authors placed in the fourth cluster include canonical authors, such as Freud (Psychoanalysis), Bandura (Social Learning Theory), and McClelland (achievement), who were cited for the individual perspective in examining behavior in groups. A number of articles citing Lewin in *HR* discussed a psychological perspective of the individual in social systems, such as social welfare systems. Several of Lewin's students, such as the social psychologists Deutsch, Cartwright, French, and Festinger, were also highly cited with Lewin in the *Journal of Social Issues*.

Social Science Theory Cluster

The last small cluster includes theorists, such as Bion, who was a psychoanalyst, pioneer in group therapy, founder of Tavistock, as well as a national hero tank commander in WWI. Other authors placed in this cluster are Kuhn (scientific paradigms), Campbell (research design), Goffman (stigma), Janis ("group think"), and Ashby (organic systems).

Figure 12. Cluster Analysis—60 Authors Cocited with Kurt Lewin in *Human Relations* (Complete linkage)



Multidimensional Scaling

The proximities matrix provided the input data for the SPSS ALSCAL routine. Appendix C contains the syntax used to execute the procedure. The two-dimensional model (displayed in Figure 13) yielded an R square value of .81 indicating that 81% of the variance in the data is explained with stress of .19 as expressed by Kruskal's Stress. Appendix H contains the stimulus coordinated used to locate the names on the map. I followed the convention of drawing loops around the data points corresponding to the clusters on the dendrogram (Kruskal, 1977).

The appearance of the clustered authors on the MDS map does not exhibit the same elongated loops as the analogous map for *JSI* in the last chapter. The viewer can observe with little difficulty that the names in the dendrogram clusters fit rather neatly together on the map, suggesting that the results of the clustering algorithm and the results of the MDS procedure produced similar results. The Social Science Theory authors, which was the last group formed by the clustering algorithm shows Janis, Campbell, and Goffman strongly pulled toward the individual and social psychologists. In the *JSI* maps, these authors are placed with the social psychologists. Kuhn, Ashby, and Bion are distant from other authors. Their placement on the map is consistent with their position on the dendrogram, which joined them last to a cluster.

The horizontal or X-axis appears to represent a continuum starting on the left with individual psychological aspects of behavior in groups and organizations to the right with an orientation on systems level phenomena. Authors, such as McClelland (achievement) and Bandura (Social Learning Theory) anchor the left side of the horizontal axis while systems theorists, such as Miller, Trist, Herbst, and Rice appear

on the right side. The dominant theme of the vertical or Y-axis moves from industrial psychologist authors, such as Hackman, Porter, and House writing about applied management and workplace issues on the top to the psychoanalyst Bion, one of Tavistock's founders, who formulated some of basic theories of group behavior, on the bottom. Other writers appearing on the bottom of the Y-axis are Freud, Goffman, and Kuhn, who all developed basic theory. The part of the map to the left of the vertical axis generally reflects more focus on the individual. The right half of the map represents a focus on the aggregate, or the whole, larger levels of patterning (e.g., group, organization, society).

Authors included in the Organizational Development Cluster in the dendrogram dominate the middle of the map. Authors appearing in the middle of a MDS map are those with the most connections to others on the map, while those furthest from the center are those with the weakest relationships to the rest of the name set. This groups' dominance is not surprising since the topics associated with this cluster are congruent with the stated mission of *HR*. Several authors in this cluster, Likert, Bennis, Lippitt, and Coch, were Lewin's colleagues and/or students. Authors in this cluster were committed to a humanistic and interactive model for organizational development. This model is exemplified by the work of Edgar Schein, internationally renowned author and consultant, on organizational culture.

Surrounding the Organizational Development names are the authors from the Management Theory Cluster. Organizational Development evolved from its original focus on group dynamics and the study of generic organizations into Organization Studies that are frequently housed in business schools. The placement of names on

the map shows that these authors also have ties to others in the data set. Most of the Management Theory authors are placed in the upper right quadrant of the map indicating an orientation to applied organization studies. Only Simon (multi-disciplinary economics and psychology) and Katz (*Social Psychology of Organizations*) are found on the left side of the map.

The lower left quadrant is comprised of social psychologists and individually psychologists writing on individual behavior in groups. Many of these names appeared in the author list for the *Journal of Social Issues*. The top left quadrant consists of the industrial psychologists writing about applied workplace issues. Several of these authors, Porter, Hackman, and Lawler, whose names are placed close together, coauthored articles. At the far right are many of the original leaders of Tavistock, who were involved in action research projects and sociotechnical systems.

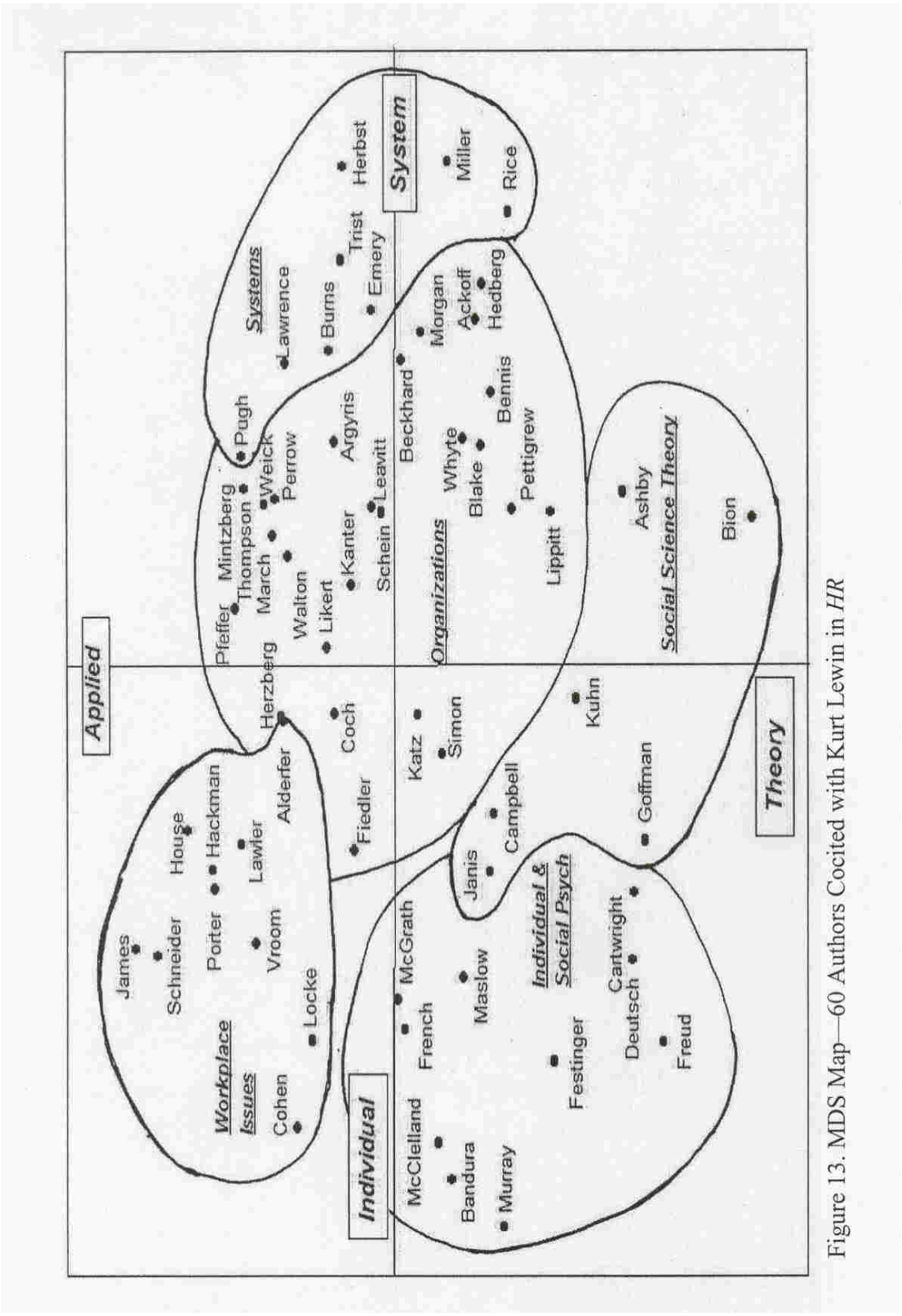


Figure 13. MDS Map—60 Authors Cocited with Kurt Lewin in *HR*

Principal Components Analysis

Principal components analysis, which also relies on a proximity matrix, is the third procedure often used by cocitation researchers in analyzing intellectual structure. Appendix D contains the syntax for SPSS FACTOR. Table 13 displays the factor structure matrix, which is a matrix of correlations between variables and factors. The factor structure matrix displays the factor loadings with a minimum of .4 for the sixty authors cocited with Lewin in *HR*. Many of the sixty authors have loadings on several factors, although the last four factors are minor. Seven factors explain 79% of the variance.

The results of the PCA procedure provide yet another perspective on the data; however, unlike the *JSI* results, the *HR* results confirm the rather tidy dendrogram and map. As discussed below a number of authors exhibit loadings above the threshold on just one component. This is consistent with clustering depicted on the map in which groups, such as the Workplace Issues authors, placed in a corner. Bion, who was discussed above for his marginal position in the dendrogram and the map, again is located in a marginal position in the factor structure matrix. He loads above the threshold only on minor Component 7 and only at the relatively modest loading of .59.

Component 1 Organization Studies accounts for 33% of the variance with 43 authors loading at a minimum of .4. This is the largest group with none of the authors loading above the threshold on this factor alone. In fact, many of the authors load on several other factors, which is an indication of the perceived breadth of subject relevance. These authors are well known for their work on applied organization

research, in a broad range of settings, both local and international, in corporations, government, and academia.

Component 2 Workplace Issues explains 18% of the variance with 21 authors loading above the threshold of .4. Authors who load highest on this factor exhibit what White (2000) termed a "crystallized citation image," indicating these authors load at a high level only on this factor. Nine authors load only on this factor and are placed on the top of the MDS map. This group includes Hackman, Lawler, and Porter, who coauthored several articles and book chapters. This factor seems to represent authors writing specifically about management from an industrial psychology and business management perspective on topics such as social influences on behavior in organizations, designs of work teams, and leadership.

Component 3 Social Psychology and Component 4 Organizational Change each account for 9% of the variance in the data. Many of the 18 Component 3 authors are familiar names from the *JSI*. Authors loading highest include Lewin's students and colleagues, such as Deutsch and Cartwright. This group includes many of the founders of group studies and experimental social psychology. Component 4 focuses on organizational change, strategic management, and organizational innovation. Authors loading particularly high on this factor include Mintzberg, Kanter, Weick, and Morgan.

Components 5 Complex Systems, 6 Action Research, and 7 Foundations of Psychology are minor factors that contribute 4%, 3%, and 2% respectively of the variance. Component 5 is a group of 22 authors, including Burns, Thompson, and Perrow, who are cited for their work on management of complex systems. Authors,

such as Trist, Emery, and Rice load highest on Component 6. These writers include some of the founders of the Tavistock Institute and writers of seminal works on action research. Component 7 is comprised of a small group of influential authors in psychology, including Freud, Maslow, and McClelland, cited for their seminal writing about group behavior, achievement, needs, and motivation.

In summary, then, Component 1 appears to represent a broad range of organization studies while Component 2 authors focus on more specific workplace and management issues. Component 3 and 6 authors often have a strong historical connection with either early work in action research or the beginnings of the Tavistock Institute. Minor Component 7 is comprised of a small group of highly influential writers in the social sciences. A number of authors loading very high on Components 2 or 4 have a crystallized citation image, unlike authors loading high on the other factors, who exhibit significant loadings on several factors. Most of the authors load above the threshold on two or three factors but only Katz loads on all the first five factors, indicating a very broad range of topics for which he is cited. This represents and is a measure of his influential book, *The Social Psychology of Organizations*.

Table 13. Structure Matrix 60 Authors Cocited with Lewin in *HR*

	Component						
	1 Org. Studies	2 Work Issues	3 Social Psych	4 Org. Change	5 Complex Systems	6 Action Res.	7 Found. Psych.
BECKHARD	.87			.41		.51	
BLAKE	.86					.50	
LIPPITT	.82		.43			.53	
WALTON	.76			.46	.40	.52	
BENNIS	.73					.65	
LEAVITT	.72				.64	.59	

Table 13. Structure Matrix 60 Authors Cocited with Lewin in *HR (continued)*

LIKERT	.64	.57			.46	.49	
COCH	.61	.59	.46			.43	
ARGYRIS	.60			.44	.51		
HACKMAN		.90					
PORTER		.90					
COHEN		.88					
LAWLER		.86					
HOUSE		.86					
VROOM		.85					
LOCKE		.78					
JAMES		.74					
SCHNEIDER		.73					
HERZBERG	.45	.70			.47	.41	
ALDERFER		.69					
FIEDLER	.41	.54	.48		.45		
DEUTSCH			.90				
CARTWRIGHT			.88				
JANIS			.85				.54
CAMPBELL			.78	.45			.58
FRENCH		.64	.74				
GOFFMAN			.68				.67
MCGRATH		.56	.64				
KATZ	.50	.46	.62	.43	.56		
MORGAN				.92	.43		
HEDBERG				.88	.54		
PETTIGREW				.84			
MINTZBERG				.84	.53		
WEICK				.81	.57		
KANTER	.43			.81			
PFEFFER				.77	.65		
ACKOFF				.73		.54	
SCHEIN	.61			.72		.42	
KUHN			.48	.69			.61
BURNS				.42	.89	.41	
PERROW				.63	.88		
THOMPSON				.55	.85		
PUGH					.84	.44	
MARCH				.66	.76		
LAWRENCE	.63				.75	.58	
SIMON			.53	.58	.65		
ASHBY				.49	.51		
RICE	.52					.87	
TRIST	.51				.44	.86	
EMERY	.41				.61	.84	
HERBST						.82	
MILLER						.82	

Table 13. Structure Matrix 60 Authors Cocited with Lewin in *HR (continued)*

WHYTE	.58			-.55		.73	
MASLOW		.58	.42				.75
MURRAY		.40	.47				.72
FREUD			.64				.69
MCCLELLAND		.55	.58				.67
FESTINGER			.64				.65
BION							.59
BANDURA		.51	.52				.54

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Table 14 illustrates how the various components are correlated with each other. The strongest relationship is between Components 1 and 6 although Component 5 also strongly related to Component 1. These relationships are not surprising given that these three factors include most of the authors with earlier and general group and organizational works. Components 4 and 7 are not strongly related to other components. Component 4 is the group including prominent management consultants while the latter group is the individually oriented writers.

Table 14. Component Correlation Matrix 60 Authors in *Human Relations*
Values >.2

Component	1 Org. Studies	2 Work Issues	3 Social Psych	4 Org. Change	5 Complex Systems	6 Action Res.	7 Found. Psych.
1	1.00				.22	.41	
2		1.00	.25		.22		
3		.25	1.00				
4				1.00			
5	.22	.22			1.00	.32	
6	.41				.32	1.00	
7							1.00

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Pathfinder Network Analysis (PFNet)

The output of the Pathfinder algorithm is a PFNet. I followed White's (2003a) recommendation and used the matrix of raw cocitation counts as the input matrix. Figure 14 is a copy of the PFNet for the 60 *HR* authors with the parameters set for r = infinity, q = n – 1. The number of links for the 60 authors is 122, or an average of two links between each pair of authors. This ratio does not accurately portray the importance of two authors, Argyris and Lawler.

Argyris occupies the central position in the network with a total of 25 direct links. Not only is he very well known for his work on organizational learning and on action research, he is also a Lewinian and a winner of the Kurt Lewin Memorial Award from SPSSI. Argyris is a giant figure in the field of organization studies and is widely cited in the literature for his "action science," (a direct descendent of Lewin's action research), and for "double loop learning." Given Argyris' prominence in the field, the subjects covered by *Human Relations* and the Lewin-centered data set of this research, perhaps it is not surprising that Argyris emerges as the center of the network. Several other authors fill less central but still important "gatekeeping" positions in the network. The individual and social psychologists that were placed on the left side of the MDS map occupy the right side of the PFNet. Festinger, one of the most prominent psychologists as well as one of Lewin's students, was the dominant figure in the intellectual network in *JSI.* Festinger's signature work is his very influential theory of cognitive dissonance. Interestingly, Festinger is linked to Lewin's other students, Cartwright, Deutsch, and French.

Lawler occupies a critical position in this network. Social network analysts (e.g., Scott, 2000) label Lawler's role in the network as the "gatekeeper" (Lewin's term) or "broker" between the large organization studies group and most of the other sub-groups identified in the previous analyses. According to social network analysts, Lawler has especially high "betweenness" as the link from Argyris to the authors writing about workplace issues. Vroom occupies the linking position between Lawler and Bandura and the other individual and social psychologists. Lawler is well known for writing about "high involvement management" and improving the quality of working life. He has written thirty books and is the director of UCLA's Center for Effective Organizations. Lawler's thrust is that the most successful organizations implement practices that benefit both the employee and the organization. It is no surprise then that Lawler links both the individual and the organizational parts of the author set.

Most of the organization studies authors link directly to Argyris except for small groups connected through Weick and Trist. Weick is the link for a group of seven authors, including March and Simon. Weick is cited for his work on cognitive processes in organizations and on organizational learning. March and Simon wrote the classic text on organizations, while Thompson is cited for work on the social science bases of administrative theory. Trist is an independent link to Argyris outside the Lawler connection. Trist is the gatekeeper for the now familiar group of Tavistock pioneers, Herbst, Rice, and Miller.

The PFNet provides another perspective to the analysis of the intellectual structure of *Human Relations.* Argyris emerges as the central figure or "star" in this

network and Lawler occupies a critical role in linking two groups of authors with different perspectives on organizations.

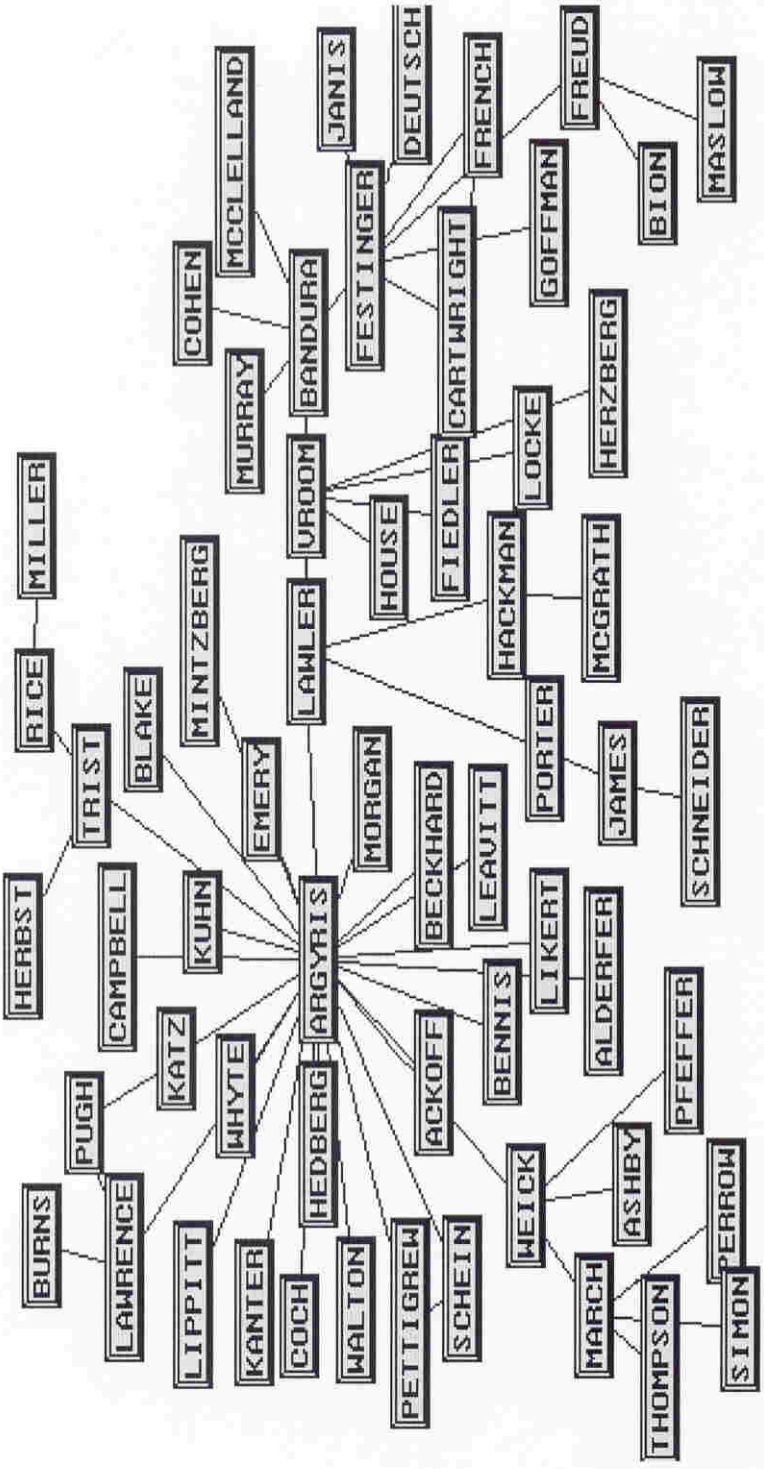


Figure 14. PFNet—60 Authors Cocited with Kurt Lewin in *Human Relations*

Figure 15 is the same configuration of data points from the PFNet above except that author names have been replaced by the author's main specialty loading from the principal components analysis. Argyris (Organization Studies) occupies the dominant center position of the graph. A number of authors from the Organizational Change subject specialty also are linked directly with Argyris, which is not surprising given that both subjects are closely related. The Workplace Issues authors are clearly connecting the Social Psychology and Foundations of Psychology specialties. Their position on the graph again illustrates these authors try to connect the individual employee with the organization so that both function better. Complex Systems and Action Research as the progenitors of Organization Studies are linked to Organization Studies in the graph but mostly connected by an intermediary author, such as Trist, part of the Action Research group at the top of the network. The Foundations of Psychology and Social Psychology groups are intermingled, which reflects the use of both with the Workplace Issues authors. Once again combining the results of the PCA and the PFNet allow the researcher to obtain additional confirmatory evidence for interpreting the data.

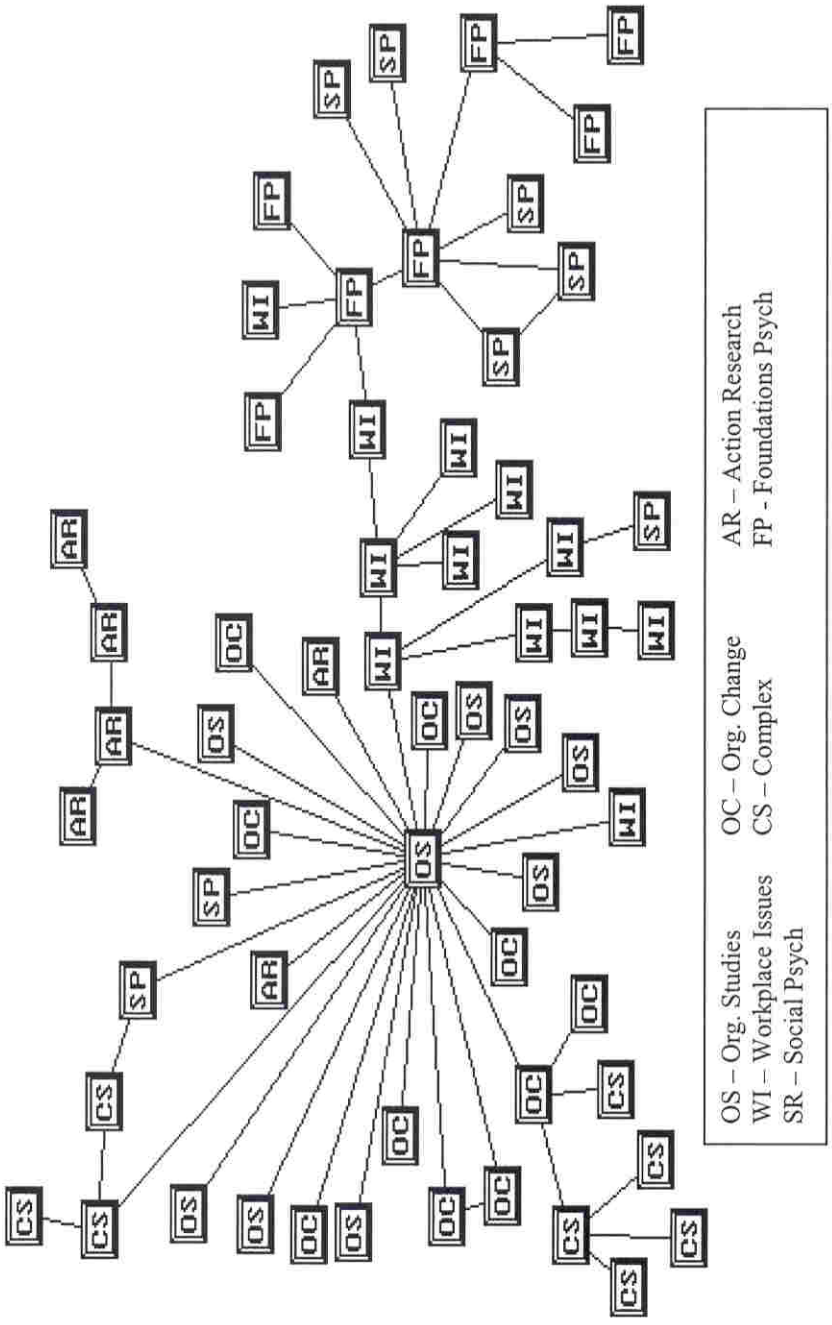


Figure 15. PFNet—Main Specialty Loadings of 60 Authors Cocited with Kurt Lewin in *Human Relations*

Determination of the Revised Author Set

After the analysis on the complete sixty-author data set, I wanted to determine whether several low frequency authors were distorting the results; therefore, I experimented with two cutoff points for inclusion in a second analysis. I followed the same procedure as I used in revising the author set for the *JSI*. Once again it was necessary to establish a more liberal threshold than the once per year rule for almost all the highly cocited authors. This study explored the potential for mapping intellectual structure from a small, focused data set, which made it necessary to establish inclusion criteria that used a more liberal threshold.

I followed the procedure adapted from Sandstrom (2001); that is, I set the following rule: When the mean cocitation rate falls below the expected value, retain a cited author so long as the cumulative percentage of the distributed cocitation values is no higher than 75% at the expected frequency of cocitation, based on the mean cocitation count. SPSS Frequencies provided summary statistics of cocitation values for each author in the data set. These statistics include the mean, standard deviation, range of values, cumulative percentages, and median values.

Table 14 displays the frequency analysis for the 60 authors cocited with Lewin in *HR*. The mean cocitation rate for the 60 authors was eleven, which was low considering the 30-year time span of the study; however, this is a rich and focused data set. My rule was to include an author if their individual mean cocitation count at the 75th percentile equals the mean cocitation count for the 60 authors, which was eleven for this journal. The data for authors with an individual mean cocitation frequency that fell below the overall mean cocitation count are shown in gray. These

authors were dropped from a subsequent analysis. These authors are relevant to understanding the intellectual structure of *HR* from a Lewinian perspective but are not widely cited in the literature outside this journal.

When I recalculated the multivariate analyses on the revised data set, I found that results were mildly improved over the results from the full 60 author set. For example, the MDS two-dimension results for the revised list are RSQ of .86 with .17 stress, which is an improvement of with .05 of the variance explained with .02 less stress. The basic configuration of the clusters and the authors relationships did not change dramatically overall unlike the results I obtained from a reanalysis of the *Journal of Social Issues* data. Below are the frequency distribution statistics for the original 60 authors and the 45-author list. Results of multivariate analyses of the revised data set follow the tables of frequency distribution statistics.

Table 15. Frequency Distribution Statistics—60 Authors Cocited with Lewin in *HR*

Mean cocitation rate 11 Gray=removed for low count

		ARGYRIS	WEICK	HACKMAN	TRIST	BENNIS	LIKERT	EMERY
Mean		31	18	17	10	13	18	9
Percentiles	25	18	8	7	5	6	9	5
	50	30	14	15	8	12	16	8
	75	40	25	24	13	16	25	13

Author		FRENCH	KATZ	HOUSE	LAWLER	VROOM	FESTINGE	SCHEIN
Mean		12	20	10	19	22	20	20
Percentiles	25	4	14	3	6	8	5	11
	50	10	20	8	16	14	15	17
	75	19	26	15	25	32	31	24

Table 15. Frequency Distribution Statistics—60 Authors Cocited with Lewin in *HR* *(continued)*

Author		BION	COHEN	MINTZBRG	PORTER	RICE	ACKOFF	MARCH
Mean		7	9	13	16	6	5	18
Percentiles	25	2	2	6	6	2	2	10
	50	5	7	10	12	4	3	13
	75	8	12	17	23	8	6	23

Author		MCCLELLA	CAMPBEL	COCH	LIPPITT	MASLOW	THOMPSO	WALTON
Mean		12	12	12	9	14	12	9
Percentiles	25	4	7	4	3	7	6	4
	50	9	11	10	8	10	9	8
	75	16	14	16	11	20	16	12

Author		BLAKE	BURNS	DEUTSC	KANTER	LOCKE	PFEFFER	SIMON
Mean		11	8	10	10	19	13	15
Percentiles	25	5	4	3	5	6	5	7
	50	8	7	8	8	14	10	13
	75	14	12	12	13	26	19	21

Author		WHYTE	ASHBY	HERBST	JAMES	JANIS	LAWRENC	MORGA
Mean		8	5	3	7	12	14	6
Percentiles	25	4	2	1	2	5	6	3
	50	7	4	2	4	9	11	5
	75	11	5	4	8	17	20	8

Author		PERROW	PETTIGR	SCHNEID	ALDERFER	BANDURA	BECKHAR	CARTWR
Mean		10	7	7	6	18	7	13
Percentiles	25	4	3	2	3	4	2	5
	50	8	5	5	5	12	4	10
	75	13	9	10	7	20	8	17

Author		FIEDLER	FREUD	GOFFMA	HEDBERG	HERZBER	KUHN	LEAVITT
Mean		9	11	9	3	10	8	9
Percentiles	25	3	2	3	1	4	3	5
	50	8	6	6	2	9	7	8
	75	12	16	11	4	13	10	12

Table 15. Frequency Distribution Statistics—60 Authors Cocited with Lewin in *HR* *(continued)*

Author		MCGRATH	MILLER	MURRA	PUGH
Mean		8	4	9	4
Percentiles	25	3	2	1	2
	50	7	4	5	3
	75	11	5	13	6

Table 16. Frequency Distribution Statistics—45 Authors Cocited with Lewin in *HR*

		ARGYRI	WEICK	HACKMAN	TRIST	BENNIS	LIKERT	EMERY
Mean		35	20	20	10	15	22	10
Percentiles	25	22	11	10	6	8	13	6
	50	35	15	18	10	13	18	9
	75	43	27	27	14	16	28	14

		FRENCH	KATZ	HOUSE	LAWLER	VROOM	FESTING	SCHEIN
Mean		16	24	13	23	27	25	22
Percentiles	25	8	18	6	12	13	10	13
	50	13	23	10	19	20	18	19
	75	23	29	17	28	36	35	25
		COHEN	MINTZB	PORTER	MARCH	MCCLELL	CAMPBE	COCH
Mean		11	15	19	21	15	14	14
Percentiles	25	5	8	9	12	7	10	7
	50	8	12	14	16	12	12	13
	75	13	18	25	27	18	17	18

		LIPPITT	MASLO	THOMPSON	WALTON	BLAKE	BURNS	DEUTSC
Mean		11	17	14	10	13	9	13
Percentiles	25	5	9	7	6	8	4	6
	50	9	13	11	10	10	8	10
	75	13	25	18	13	17	14	13

		KANTER	LOCKE	PFEFFER	SIMON	WHYTE	JANIS	LAWREN
Mean		11	24	16	18	9	14	16
Percentiles	25	7	10	7	11	6	8	9
	50	8	18	11	16	8	12	12
	75	13	29	23	23	11	18	24

Table 16. Frequency Distribution Statistics—45 Authors Cocited with Lewin in *HR*

		PERROW	BANDUR	CARTWRIG	FIEDLER	FREUD	GOFFMA	HERZBER
Mean		12	22	15	11	12	10	13
Percentiles	25	6	7	8	7	2	5	7
	50	10	15	13	10	8	8	10
	75	15	27	19	13	17	13	15

		LEAVITT	MCGRAT	MURRAY
Mean		10	9	11
Percentiles	25	6	4	2
	50	10	9	8
	75	13	13	14

Cluster analysis

Figure 16 displays the dendrogram for the top 45 authors cocited with Lewin in *HR* (selected at the minimum frequency of eleven cocitations). Cluster labels are boxed on the right with clusters separated by bold horizontal lines. The revised author set is divided into five coherent clusters with no isolates. The process of linking authors into clusters shows that the Management Theory and Organizational Development clusters are joined rather early followed by the Workplace Issues, displaying a logical progression. In contrast the Individual Psychology and Social Psychology authors are linked late in the process and are finally connected to the other clusters almost at the end of the procedure. This suggests that the set of 45 authors divides into two very different themes with little similarity between them.

The cluster analysis of the revised author list creates a dendrogram that differs from the original dendrogram in two major ways. The first change is that the Systems and Action Research Cluster that included the founders and early leaders of the Tavistock Institute has disappeared. The four authors who are present in the revised set are dispersed between the Management Theory Cluster (Burns) and the

Organizational Development Cluster (Trist, Emery, and Lawrence). The second change is that the Social Science Theory and the Individual and Social Psychology Clusters are configured differently. Several authors from the basic Social Science Theory Cluster have merged with the Individual Psychology Cluster. Individual and Social Psychology have now split into two groups. Below are descriptions of the clusters.

Management Theory

The author list in this cluster is pruned by four names—Morgan (images of organizations – systems view), Hedberg (organizational learning), Ackoff, and Pettigrew—from the original. Only Burns (management of innovation) was added to this cluster. This cluster now more reflects more strongly than previously its authors' involvement with management of complex organizations especially corporations, organizational learning, and managing innovation.

Organizational Development

Trist and Emery (sociotechnical systems) and Lawrence (Tavistock open systems) joined this cluster that now includes eleven authors, equaling the Management Theory Cluster in size. The cluster now has a strong representation of classic figures in organization studies. Coch moved to the Workplace Issues Cluster, which is appropriate because he is cited for his classic 1948 paper "Overcoming resistance to change."

Workplace Issues

This cluster also saw additions with Fiedler, who wrote about how an effective leader needs a match between the motivational structure and situational control. The strongest figures in this cluster remain—Porter, Hackman, and Lawler.

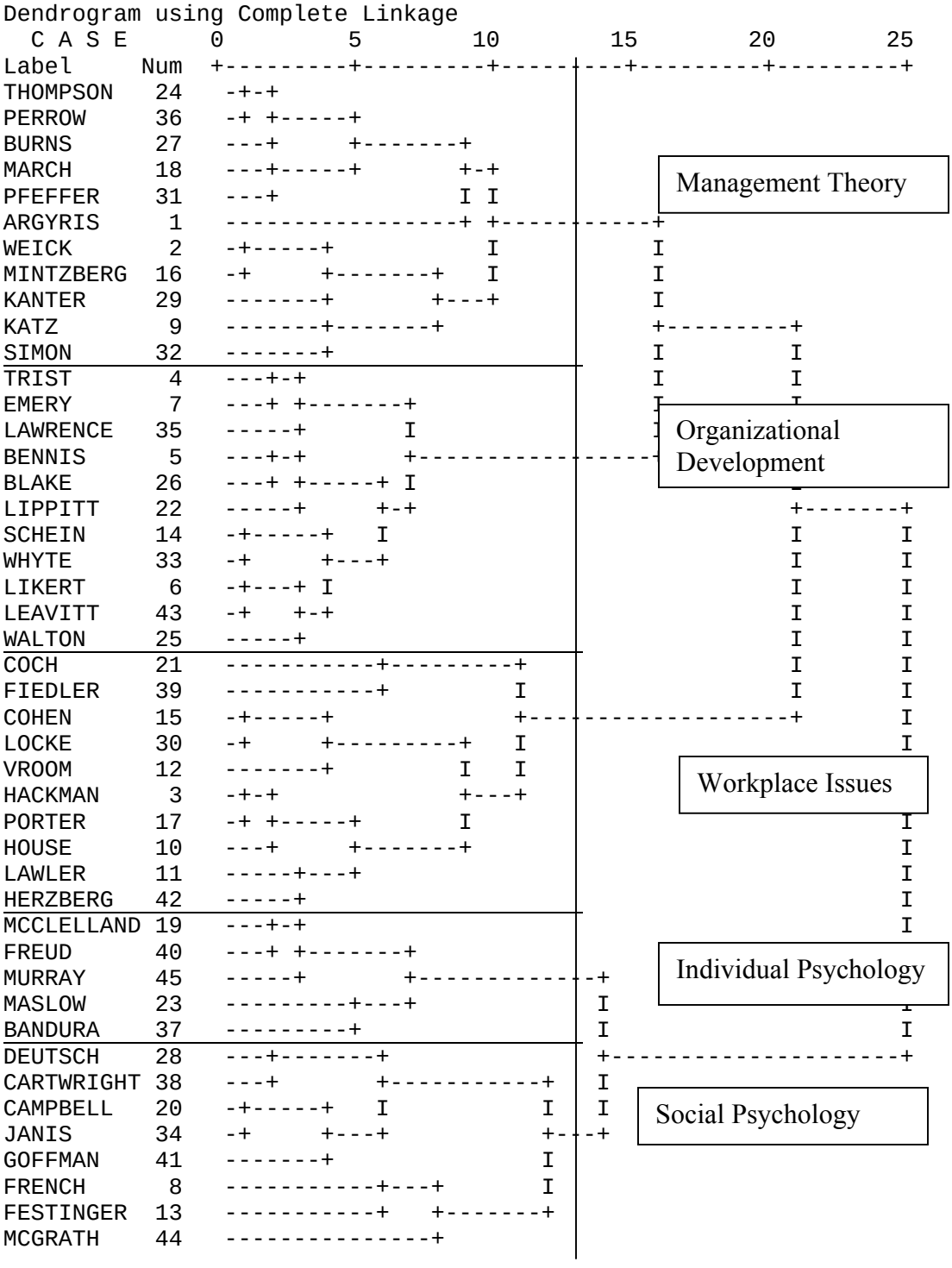
Individual Psychology

The removal of the low cocitation count authors resulted in a split between the individual and social psychologists. McClelland, Murray, Freud, Maslow, and Bandura are all major figures in psychology and are widely cited across many social science disciplines.

Social Psychology

This last cluster includes several of Lewin's key students—Festinger, Deutsch, Cartwright, and French—who were associated with the Group Dynamics Research Center at the University of Michigan. The Group Dynamics Center originally co-published *Human Relations* with the Tavistock Institute.

Figure 16. Cluster Analysis—45 Authors Cocited with Lewin in *HR*



Multidimensional Scaling

The proximities matrix provided the input data for the SPSS ALSCAL routine. Appendix C contains the syntax used to execute the procedure. The two-dimensional model (displayed in Figure 17) yields an R square value of .86 indicating that 86% of the variance in the data is explained with stress of .17 as expressed by Kruskal's Stress. Appendix I contains the stimulus coordinates used to locate the names on the map. Again I followed the convention of drawing loops around the data points corresponding to the clusters on the dendrogram (Kruskal, 1977).

The appearance of this map lacks the tidiness of the 60-author map viewed earlier. Although the map divides into three distinct areas the cluster loops are, in the case of the organization studies clusters, elongated to capture all the names, caused by the two different procedures. The dendrogram divided clusters into distinct groups, which can be seen clearly on the map. On one side the organization studies authors are distant from the individual and social psychology authors. The Workplace Issues cluster maintains its separate position from the other groups. The two cluster on each side of the map look as if they should be melded into one large cluster on each side.

Likert and Lippitt are especially distant from the others in their cluster reflecting the difference in the information obtained from the cluster analysis and the MDS procedures. Likert's profile is most similar to the authors cited for their applied work where his research on management styles in organizations, especially in the industrial situations, is relevant. Lippitt, on the other hand, is widely recognized for his work on leadership styles in organizations and is placed in a similar position on the Y-axis to colleagues, Deutsch and Cartwright. Simon's position on the MDS map

is also worth noting. He is clustered early with Kanter and Katz in the Management theory cluster as a result of his work on administration and management. On the MDS map, however, Simon is the only name from the organization studies authors that is placed to the right of the Y-axis, albeit just barely on the other side. His profile shows almost equal similarity to both halves of the map since he is also highly cited in this data set for his work in cognitive psychology and development of concepts like "satisficing."

As mentioned above, the results parallel those obtained for the original 60-name data set. The horizontal or X-axis displays a range of subjects from the individual psychology focus on the far left, exemplified by Murray, Freud, and Bandura to the organizational or macro focus on the far right. The shift from the right anchor of the X-axis from systems to organizations reflects the incorporation of several systems authors into the Organizational Development cluster and the elimination of several infrequently cited names. The Y-axis retains the same applied to theoretical continuum as the first MDS map of *HR*.

The organization studies authors remain in two defined clusters on the dendrogram but are commingled on the MDS map. The composition of these clusters remained mostly intact. Authors located in the lower left quadrant are divided into two clusters in the map of the revised author list. The individually oriented authors are now distinct from the social psychologists. This dovetails with the social psychologists' position between the organization studies groups and the Individual Psychology Cluster.

Perhaps the most interesting feature of this map compared to the first *HR* map is that the vertical axis essentially divides the map into an individually oriented half on the left and an organizationally oriented half on the right. The Workplace Issues authors are closest to spanning both sides of the map but are placed on the top of the map anchoring the applied pole of the Y-axis. This placement is consistent with the topics studied by these authors who try to discern, for example, how to motivate employees to function better in the organization or how to determine the best individual for a job or how best to supervise employees.

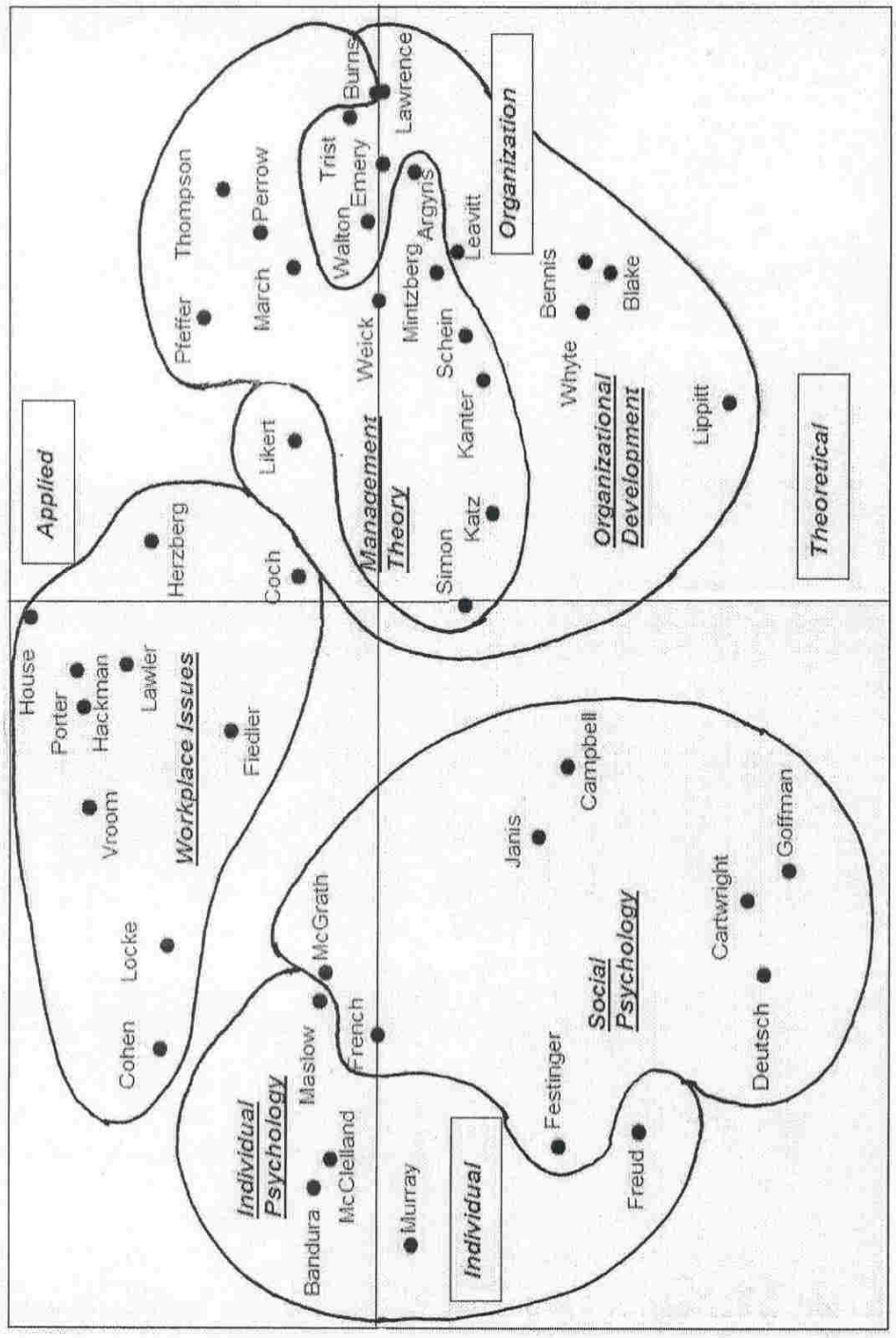


Figure 17. MDS Map—45 Authors Cocited with Kurt Lewin in *HR*

Principal Components Analysis

Principal components analysis is the third procedure followed for the revised 45-author list. Appendix D contains the syntax for SPSS FACTOR. Table 17 displays the factor structure matrix, which is a matrix of correlations between variables and factors. The factor structure matrix displays the factor loadings with a minimum of .4 for the 45 authors cocited with Lewin in *HR*. Many of the 45 authors have loadings on several factors, although the last four factors are minor. Six factors explain 78% of the variance.

The factor structure matrix adds information to the exploratory analysis of the data set. Lippitt, whose map and cluster placement was discussed earlier, has a large loading only on Component 1 Organization Studies. This component has a time dimension in that many of the authors with highest loading had close association with Lewin in areas related to organization studies. Likert's affinity with both the Workplace Issues authors and the Organization Studies authors is confirmed as he has high loadings on both components related to these topics. The cluster algorithm placed him in the Organization Development group but his profile is also very similar to the Workplace Issues group, which the cluster algorithm is unable to depict. Simon is firmly in the camp with the Management theory authors despite his pull toward the individual and social psychologists. In this case his cluster placement is confirmed.

Component 1 Organization Studies, accounting for 31% of the variance, is composed primarily of authors from the Organizational Development Cluster and the Management Theory Cluster. This is comparable with the results of the MDS map that displays these two clusters as intermingled. Authors with the highest loadings are

those with connections to Lewin, such as Bennis, Lippitt, Trist, and Likert. These authors also exemplify the classic organization studies scholars while Mintzberg and Kanter with lower loadings on this component represent the newer organization focus associated with business.

Component 2 Foundations of Psychology with 21% of the variance largely includes the names from the Individual and Social Psychology Clusters. Freud, Murray, and McClelland are prominent in this component. Authors in the Workplace Issues Cluster once again form a coherent sub-group in the author list for Component 3. Several authors from the psychology clusters also load above the threshold on this component. Workplace Issue authors tend to write work consistent with Lewin's interest in empowering workers expressed in early critique of Taylorism (1920). Lawler (quality of working life), House (work stress), Herzberg (job satisfaction) represent the type of topics studied by these authors. Thus, citing authors use the work of psychologists like McClelland (achievement), Maslow (hierarchy of needs), and Lippitt (leadership styles).

Component 4 accounts for 8% of the variance. This component appears to represent the Management Theory Cluster. The highest loadings are found with Perrow (complex organization and bureaucracies), Thompson (social science basis of administration theory), and Burns (management of innovation). Components 5 Group Dynamics and 6 Strategic Change are minor components accounting for 4% and 3% of the variance respectively. Here the familiar group of Lewin's students—French, Deutsch, and Cartwright—is cited for their work on basic group and organizational issues, such as control, leadership, and power dynamics.

Table 17. Structure Matrix 45 Authors Cocited with Lewin in *HR*

	Component					
	1 Org. Studies	2 Found. Psych.	3 Work. Issues	4 Mgmt. Theory	5 Group Dynam.	6 Strateg. Change
BENNIS	.88					
WHYTE	.86			.42		
LEAVITT	.86			.58		
LIPPITT	.86					
BLAKE	.81					
TRIST	.81			.48		
WALTON	.80			.47		
LIKERT	.79		.53			
EMERY	.77			.60		
SCHEIN	.77			.58		.42
COCH	.66		.60			
KATZ	.62			.58	.50	
ARGYRIS	.54			.49		
FREUD		.87			.51	
MURRAY		.85				
MCCLELLAND		.85	.45			
MASLOW		.77	.50			
GOFFMAN		.70			.53	
CAMPBELL	.42	.68			.62	
FESTINGER		.66			.52	
BANDURA		.64	.43			
PORTER			.89			
HACKMAN			.88			
LAWLER			.86			
HOUSE			.86			
COHEN		.47	.84			
VROOM			.83			
LOCKE		.53	.75			
HERZBERG	.53		.72			
FIEDLER			.52			
PERROW	.43			.95		
THOMPSON				.89		
BURNS	.47			.85		
MARCH				.84		
PFEFFER				.83		.50
WEICK				.83		.48
MINTZBERG	.41			.76		.58
SIMON				.74		
LAWRENCE	.70			.71		
DEUTSCH		.44			.90	
CARTWRIGHT					.87	
JANIS		.66			.74	
FRENCH		.43	.57		.67	
MCGRATH			.44		.59	.56
KANTER	.50			.55		.67

Extraction Method: Principal Component Analysis. Rotation Oblimin

Component Correlation Matrix

The matrix displayed in Table 18 reports how the components from Table 17 are associated with each other above the threshold of .2. As might be expected from the narrative above Components 1 Organization Studies and 4 Management Theory are correlated above the .2 level as are Components 2 Foundations of Psychology and 5 Group Dynamics. Components 1 and 4 include the two clusters of organization studies scholars, which are placed close together on the MDS map. Individual and social psychologists have the highest loadings in Components 2 and 5 and are also placed in close proximity on the MDS map.

Table 18. Component Correlation Matrix—45 Authors in *HR*

Component	1 Org. Studies	2 Found. Psych.	3 Work. Issues	4 Mgmt. Theory	5 Group Dynam.	6 Strateg. Change
1	1.00			.40		
2		1.00			.37	
3			1.00			
4	.40			1.00		
5		.37			1.00	
6						1.00

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Pathfinder Network Analysis (PFNet)

The output of the Pathfinder algorithm is a PFNet. I followed White's (2003) recommendation and use the matrix of raw cocitation counts as the input matrix. Figure 15 is a copy of the PFNet for the 45 *HR* authors with the parameters set for r = infinity, q = n – 1. The overall configuration echoes that of the first PFNet created from the 60-author data set.

Once again Argyris occupies the central position in the network with a total of 19 direct links. Several other authors fill less central but still important bridging

positions in the network. There is an interesting path from Argyris to Lawler (repeated from the first *HR* map) to Vroom (worker motivation) to Bandura. Bandura connects the psychologists to the Organization Studies scholars. The individual and social psychologists that were placed on the left side of the MDS map occupy the right side of the PFNet. Festinger, once again is an important central figure for the psychologists. Festinger's triangle with Lewin's other students, Cartwright and French is a familiar feature of the network.

Most of the Organization Studies authors link directly to Argyris except for a small group connected through Weick. Weick is the link for a group of five authors, including March and Simon. Weick is cited for his work on cognitive processes in organizations and on organizational learning. March and Simon wrote the classic text on organizations, while Thompson is cited for work on the social science bases of administrative theory. The PFNet provides another perspective to the analysis of the intellectual structure of *Human Relations.* Argyris emerges as the central figure or "star" in this network and Lawler occupies a critical role in linking two groups of authors with different perspectives on organizations.

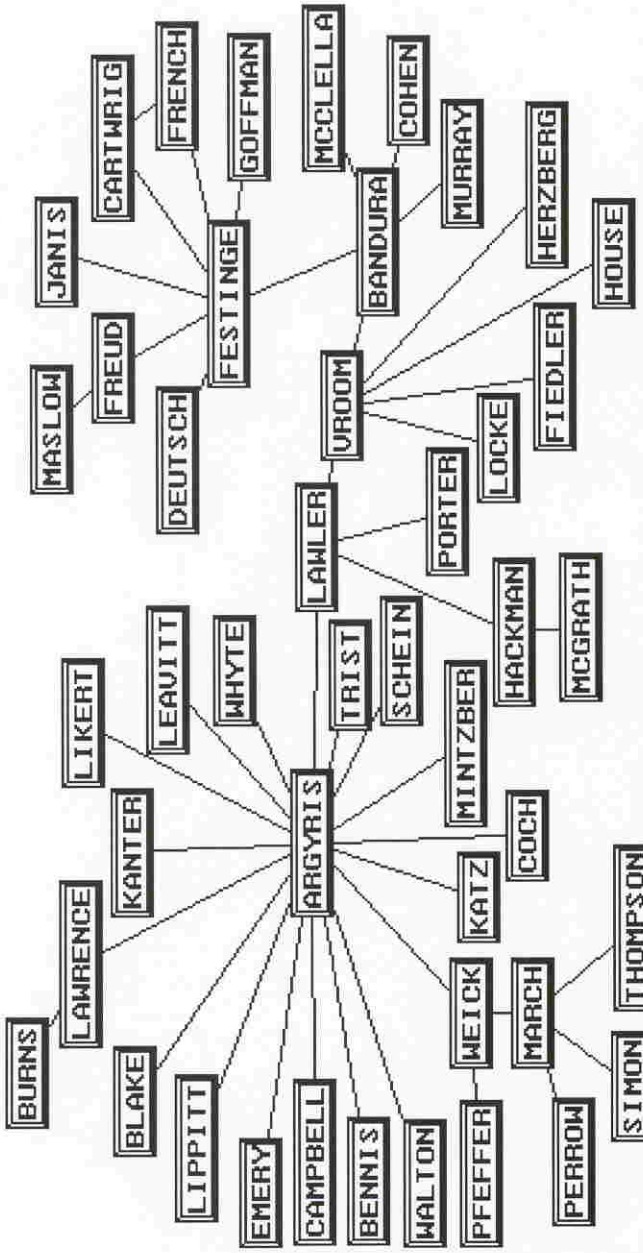


Figure 18. PFNet—45 Authors Cocited with Kurt Lewin in *Human Relations*

Figure 19 is the PFNet above with the main specialty loading of each author substituted for the author name. Once again the Organization Studies specialty dominates the left half of the graph. Management Theory comprises a cluster in the lower left linked to the rest of the graph by the high cocitation frequency of Weick with Argyris. The Workplace Issues author Lawler is cocited with Argyris while Vroom is most highly cocited with Lawler. Vroom is the link for the Foundations of Psychology and Group dynamics authors to connect with the other half of the network.

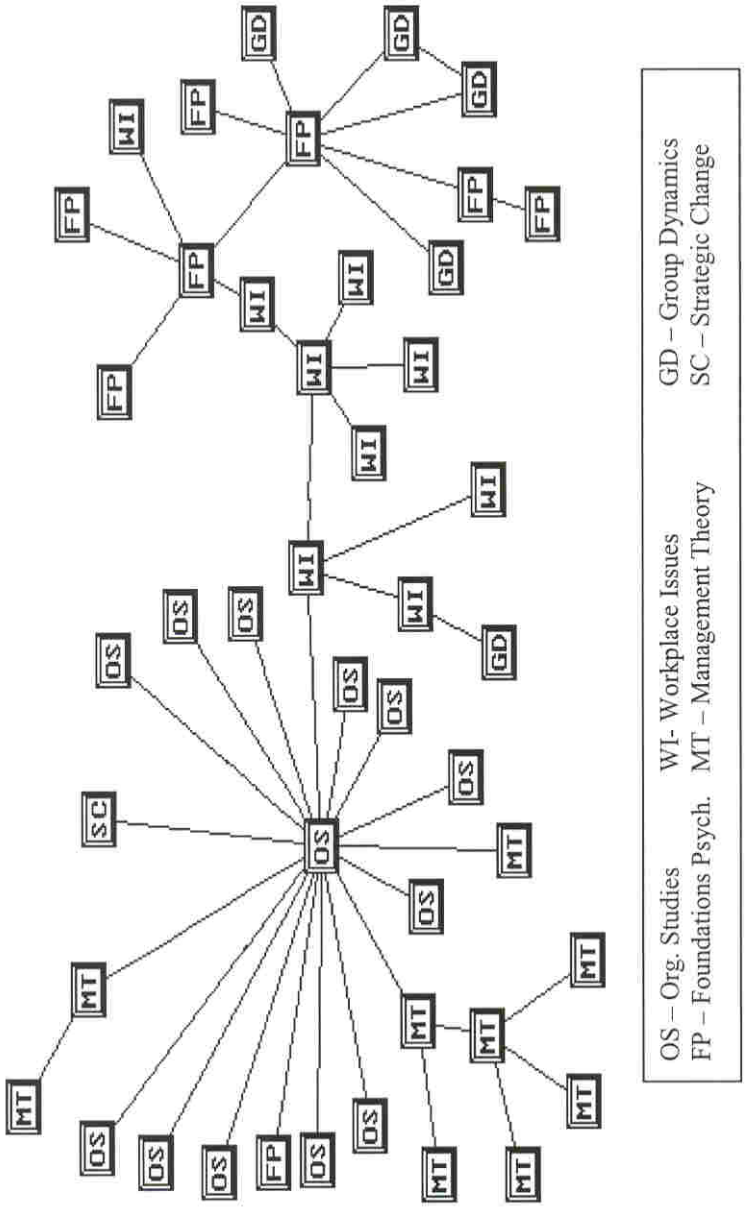


Figure 19. PFNet—Main Specialty Loadings of 45 Authors Cocited with Kurt Lewin in *Human Relations*

Summary of author cocitation context analysis

The cocitation context analysis derived from authors cocited with Lewin in *Human Relations* displays coherent structure for documents in which Lewin is cited. The majority of authors are cited for work that expressed the influence of Lewin's contributions to the study of organizations, especially in the areas of organizational change, culture and learning. Related to these topics is more specialized interest in either workplace issues and employee performance or systems theory. Individual and social psychologists occupy less prominent positions for this set of authors who cited Lewin. Argyris and Lawler emerge as key figures in the networks of cited authors. Argyris is the "star" with the highest number of connections to other authors in the set. Lawler bridges two halves of the cited author set, namely, the organization studies group and the individual and social psychologist group. In *Human Relations*, unlike the *Journal of Social Issues*, revising the inclusion threshold to exclude authors with low cocitation counts did not produce major changes in the MDS map, the dendrogram, or the PFNet created from the revised author data set.

VI.3. Citation Context Analysis of References to Lewin in *Human Relations*

In this section I explain the data collection procedures and present the results obtained from citation context analysis of the references to Lewin in 122 articles in *Human Relations* between 1972 and 2001. These procedures are the same as those followed for the analysis of citation function in the *Journal of Social Issues.*

Data Collection

Two coders independently read each article that cited Lewin and assigned each article to one of three categories, (1) Research Report, (2) Review, or (3) Theoretical/Conceptual, using the criteria described in Chapter IV Research Design. Each cited reference to Lewin was coded separately and classed as either Totemic or Substantive according to the criteria outlined in Chapter IV. Some articles contained multiple references to Lewin, which results in the number of references outnumbering the number of articles. The total number of references was 184. All data were assembled in Excel spreadsheets for examination.

Citation Context Analysis

Human Relations presents a different configuration of article categories than the *Journal of Social Issues.* A chi square test for the association of article class to citation category found significant difference in two areas. The Totemic citations were significantly lower than predicted in the Reviews and Theoretical/Conceptual articles and higher in the Research Reports ($p>.001$). In the *HR* data set Research

Reports citing Lewin were by far the dominant category with half of the of 122 articles while Reviews and Theoretical/Conceptual articles occurred much less frequently, with 19% and 27% of the articles respectively (Table 19). Like the *JSI, HR* states its interest in reporting results of action research but unlike the *JSI,* authors citing Lewin in *HR* much more frequently in Research Reports.

Table 19. Classification of Articles Citing Lewin in *Human Relations*

Citation Category	Document Class			Total
	Review	Res Rpt	Theo/Con	
Totemic	19.00%	49.40%	22.80%	34.20%
Substantive	81.00%	50.60%	77.20%	65.80%
Total # citations	42	85	57	184

With one exception, the number of articles referencing Lewin was surprising steady over the thirty-year period covered by this study. The table below summarizes the number of articles citing Lewin in five-year segments. The period between 1987 and 1991 experienced a sharp drop in the number of articles citing Lewin; however, authors then began to cite Lewin at the same rate as previously. The overall average of articles citing Lewin was four per year, with a range of zero for 1987 to twelve for 1976. Once again, Lewin's work remained quite relevant to citing authors.

Table 20. Articles Citing Lewin in *Human Relations* Over Time

	Publication Years					
	1972-76	1977-81	1982-86	1987-91	1992-96	1997-01
No of articles	22 18%	22 18%	26 21%	8 6%	22 18%	22 18%

Figure 20 (below) illustrates the number of Totemic and Substantive citation in each of the three document categories. Although the total number of Substantive

citations was approximately double the number of Totemic citations, there was considerable variation in the proportion of Totemic and Substantive citations among the three document types. As noted above, Research Reports were the dominant document category with the greatest number of references to Lewin. In this article type, the number of Totemic and Substantive citations were almost equal. This is surprising because most Research Reports contain a small literature review section that briefly mentions the major work relevant to the current study. Obviously, Lewin's work was used in a substantive way by authors writing Research Reports. Review and Theoretical/Conceptual articles each contained about twice as many Substantive as Totemic references.

Figure 20. Comparison of Citation Class and Document Category in *HR*

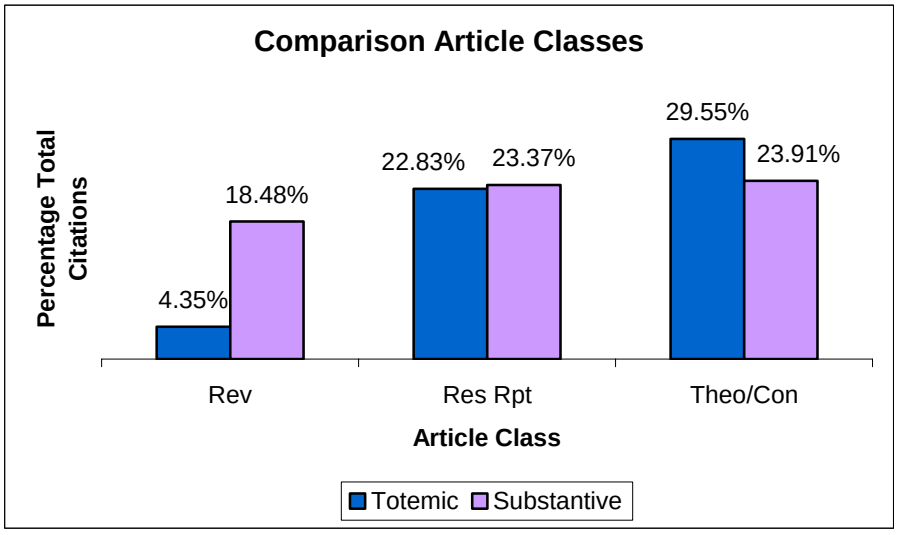
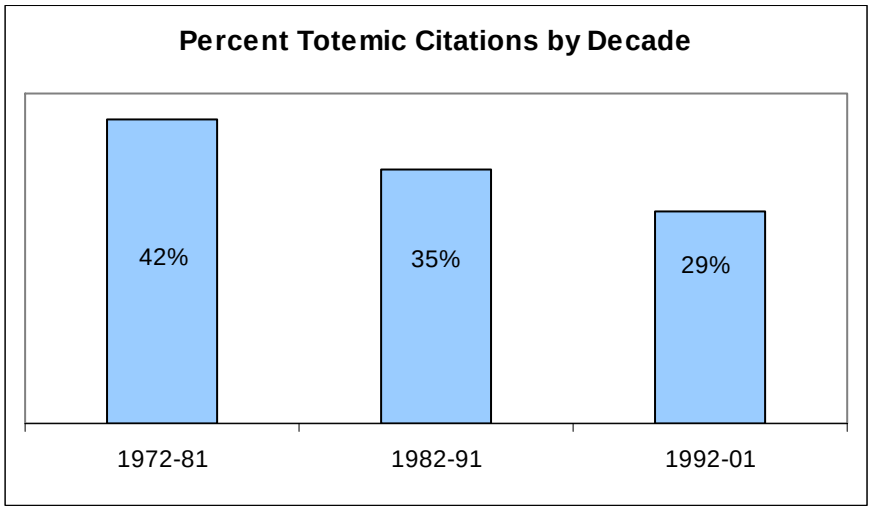


Figure 21 represents the percentage of Totemic citations over the three decades covered in this study. The percentage of Totemic citations decreased each decade from 42% in the first decade to 35% in the second decade to a low of 29% in the third decade. This is contrary to expectation and somewhat puzzling because *HR*

did not publish the type of retrospective issues that *JSI* did. Again it suggests that perhaps Lewin's work has undergone resurgence in interest by researchers.

Figure 21. Change in Citation Function in *Human Relations* over Time



The question again arises why these results are different that those previously reported by other researchers. Most of the same possible explanations discussed in the parallel section in the previous chapter apply here as well. It is possible that my definition of Totemic and Substantive citations biased the results, as did my coding each citation. Since Totemic citations were likely to occur less frequently in an article and Substantive citations might occur several times in an article perhaps the sheer weight of numbers might skew the results. It is also possible authors citing Lewin in a specialty that values Lewin highly tends to produce authors who use Lewin's work substantively although the Tavistock Institute does not have the same overt and visible identification with Lewin as does SPSSI. *HR* does publish research reports and they constitute a sizable proportion of the articles citing Lewin.

One possible explanation for these results is related to the rise of Organization Studies as a discipline. An observation someone made when viewing the two maps from the pilot study was that she thought I documented the beginning of the field of Organization Studies. *HR* is an outlet for Organization Studies authors, many of whom find Lewin's work and those of his intellectual descendents like Schein, compelling. This may be a case where use of Lewin's work is increasing among a new generation of researchers.

I now turn to an examination of the content of the references to Lewin, to answer the question of which ideas of Lewin authors find relevant and, therefore, cite.

Cited Concepts

A few of Lewin's ideas constituted almost all the Lewin references in *Human Relations,* whether the citations are Totemic or Substantive. The reader is referred to the "Intellectual History of Kurt Lewin," located in Appendix E for a description of Lewin's major contributions.

Lewin's most frequently cited work of in *HR* was *Field Theory in Social Science: Selected Theoretical Papers* (1951), edited by Cartwright. Authors cited a number of concepts from that book, which was noted in the previous chapter, is a compilation of many of Lewin's theoretical formulations. The most frequently cited term was "field theory," which seems to be used as shorthand for a number of Lewin's ideas. This seems to fit with Small's (1982) idea of the citation as a standardized concept symbol. Frequently mentioned terms that are part of Field Theory were "life space" and "force field." Authors citing this term often refered to

other concepts, such as "leadership style," the second most frequently occurring concept. Research on characteristics of successful leadership in organizations was a major theme in the articles citing Lewin. Many of the authors cocited with Lewin were cited for their work in this specific area.

Another oft-occurring concept in the *HR* articles was Lewin's model for planned organizational change. Lewin proposed a three-step process, which he labeled "unfreezing, changing, and refreezing." "Unfreezing" is the third most occurring concept. It was hardly surprising in a journal devoted to organizational change and action research that this concept is frequently cited. Like Field Theory, the stage model for organizational change is applicable for groups at various levels of size and complexity. Citing authors also used Lewin's concept of "quasi-stationary equilibrium," which refers to the state of groups prior to initiating the change process. Components of "group dynamics" that also appeared include "group process," "group climate," "group decision making," and "democratic participative management."

One readily observable difference between concepts cited in *JSI* and concepts cited in *HR* was that references to social action were noticeable fewer. Terms related to action research, such as "methods of social change" and "minority group status, were used only a few times. Table 21 displays the most frequently cited Lewinian concepts in *HR*.

Table 21. Frequently Cited Lewinian Concepts in *Human Relations*

GROUP DYNAMICS	FIELD THEORY
Democratic & authoritarian leadership style	Life space
Model for organizational change	Force field
Unfreezing, change, refreezing	
Quasi-stationary equilibrium	
Group climate	
Group decision making	
Group process	

Summary of citation context analysis

Human Relations presents a different pattern of contexts in which Lewin is cited than was found in the *Journal of Social Issues*. Research Reports were the dominant mode of article in *HR*, with Reviews and Theoretical/Conceptual articles occurring much less frequently. The number of references to Lewin was rather stable over the thirty-year period of this study, with the exception of the time from 1987-1991 when there was a sharp drop. Substantive citations totaled a great deal more than the Totemic citations, although this was not uniform across document types. Substantive citations appeared in much greater quantity than do Totemic citations in Review and Theoretical/Conceptual articles. In Research Reports, however, there were somewhat more Totemic than Substantive citations. Authors seemed to use Lewin's work differently depending on the type of article they were writing. The overall proportion of Totemic citations decreased over time.

Authors used only a few of Lewin's concepts that relate directly to a focus on organizational studies. These concepts were Lewin's three phase model for planned organizational change, which is comprised of upsetting the "quasi-stationary equilibrium" of the usual environment by "unfreezing, changing, and refreezing." The

role of the leader and the "style of leadership" were frequently mentioned ideas of Lewin's.

VI.4. Congruence with Published Literature

Lewin had an interesting relationship with the Tavistock Institute. Marrow (1969) recounts how a young Trist, one of the founders of Tavistock, was asked to escort Lewin for an afternoon when Lewin visited London. Lewin expounded his theories to Trist, who thereafter proclaimed himself a Lewinian. Trist went to on to become an eminent researcher of sociotechnical systems and produced some of the seminal work on action research projects. Tavistock initially published the journal *Human Relations* in conjunction with the University of Michigan where the Lewin group moved after his death. The first issue of *HR* in 1947 was dedicated to Lewin and posthumously published his important papers on "The frontiers of group dynamics." In 1954 Festinger and his colleagues provided the entire contents of an issue of *HR* where they presented their work on social comparison theory and cognitive dissonance. That Lewin and his students are frequently cited in *HR* even after several decades is perhaps not unusual.

Another factor is relevant to understanding the relationship between Lewin and *HR*. *HR* describes itself as focused on interdisciplinary action research especially with organizations and groups. Lewin's work on group dynamics and organizational change found a congenial welcome in Organization Studies and Organizational Development. Lewin's interests in these topics date from his 1920 critique of Taylorism. Lewin was a humanist and viewed as counterproductive Taylorism's model of the employee as a machine-like component that needed control. Lewin's

work on leadership styles and democracy was easily transferred to the workplace. The early organizational development work took place in a number of industrial settings (Marrow, 1969). Lewin and his colleagues demonstrated that empowering workers and harnessing the dynamics of the small group leads to increased productivity, heightened morale, and less absenteeism (Gabor, 2000).

The comments of Edgar Schein quoted earlier, Argyris' use of action science (action research), and T.J. Allen's formulation of the "information gatekeeper" illustrate how Lewin's ideas permeate the discipline. I did not find accounts of the discipline that negated Lewin's importance. References to Lewin acknowledge the validity of his ideas. It appears that Lewin's work is valued and useful unlike the situation in psychology where the reaction to Lewin is mixed. As noted in the last chapter Carr's (2003) introductory textbook places Lewin's work as relevant to the study of contemporary subjects. "Whether we call them workplace teams, study circles or community-based organization, the group is back. Globally, we are seeing groups exalted as a key to unlocking full human potential at work, in education and in the community" (p. 87). Carr goes on to discuss what he terms "Lewin's classic findings" on democratic decision-making and planned group change and proceeds to discussion of globalization versus local identity and the "techno-scape" of the Internet. These topics are ones that contemporary research in Organization Studies is addressing.

The results of the author cocitation context analysis presented a range of subjects of interest to editors and readers of *HR* and show how Lewin is cited with authors whose work corresponds to these subjects. He is cited with a number of

prominent authors in organizational change, culture, and management and workplace issues. Thus, the Lewinian perspective of intellectual structure coincides with the stated aims of the journal.

Lewin is one of the most highly cited authors in *HR* and the citation context analysis reveals that he is cited increasingly over time. Research Reports are a more important venue for citing Lewin than in the *JSI*. It is in Research Reports that Lewin's work is used most in a totemic way. Lewin is primarily cited for Field Theory, especially his model of planned organizational change and components of group dynamics, like climate and leadership. Citing authors in *HR* overall made substantive use of Lewin's concepts.

In summary, Lewin has totemic status in the Tavistock Institute although less so than in SPSSI. Tavistock does not have a Kurt Lewin Award or anniversary issues about Lewin; however, he is regarded as a major figure in the history of the organization. Lewin's work is useful and relevant to citing authors. The topics and authors with which he is cited reflect the interests of Tavistock and contemporary concerns in organization studies. In the next chapter I summarize the results of this research and place the findings within the context of scholarship.

VII. DISCUSSION AND CONCLUSIONS

In this chapter I discuss the implications of this research and draw conclusions from the results of the research questions posed in Chapter II. I conclude with recommendations for further research.

The role of scientific specialties

Scholars of scholarly communication generally acknowledge that knowledge production is organized in disciplines as well as transdisciplinary, multidisciplinary, interdisciplinary, and specialty groups although the operational meaning of the latter three terms varies according to individual using them. Van den Besselaar & Heimeriks (2001) point out that the last three terms seem share the characteristic of being defined in contrast to disciplinary groups; in other words, they are the "non-disciplines." Interdisciplinarity has been characterized as "by an explicit formulation of a uniform, discipline-transcending terminology or a common methodology. A transdisciplinary approach goes one step further, as it is based on a common theoretical understanding…" (van den Besselaar & Heimeriks, 2001, p.706). Such non-disciplinary groups attract researchers' attention because of recognition that new knowledge or at least different applications of existing knowledge occurs in these units. A number of writers choose the more general term "specialty," which can include focus on a particular problem, use of certain methodologies or tools, or an agreed upon theoretical model.[11] Scientific specialties have been a focus of study

[11] Some writers, such as Knorr-Cetina, who prefers to the term "epistemic cultures," criticize the notion of a specialty (1999) although her definition has elements in common with concepts discussed here.

since the 1970s as Griffith and Mullins (1972) among others investigated communication networks of coherent activist groups. Their report of the components of successful specialties was followed by Mullins' important book (1973) on the formation of theory groups in American sociology.

A problem researchers face is crafting the operational characteristics of such non-disciplinary groups because specialties do not have easily defined boundaries. Gläser (2001) describes membership in a specialty as being a matter of self-perception. If an individual perceives himself or herself to be a member, then one is, although others may not judge an individual to be a member. Gläser further states that if a knowledge claim is judged relevant and used by that specialty, one is judged a member of the specialty, a view consistent with that of many bibliometricians.

Authors add new knowledge by interpreting existing knowledge (citing previous work) and adding one new knowledge claim (Gläser & Laudel, 2001). In this way citation studies can reveal a scholar's various and changing specialties as evidenced in use of their work (McCain, 1984). Authors pursue different areas of research but specialty is refined by the relative importance citing authors attach to particular work. An author's citations reveals the citing author's mental map of his or her intellectual endeavor and the cited authors' work.

White's (2000) development of ego-centered citation analysis provides four different perspectives of the uses made of a focal author's work. Cronin and Shaw (2001) employed ego-centered citation analysis to conduct analyses of three prominent information scientists. The present research extended White's and Cronin and Shaw's work in two case studies of journal communities that share some

significant elements. Authors who published in a specialty's key journal and who cite an important founder for the specialty were presumed to belong to the journal community. My rationale was that the authors indicate their conversance with the common theoretical understanding, terminology, and/or methodology by citing the founder in the specialty's journal. Of course, some authors are much more important to the life of the specialty and others may be members very peripherally or for a short time.

Both the Society for the Psychological Study of Social Issues (SPSSI) and the Tavistock Institute meet the requirements for successful specialty groups outlined by Griffith and Mullins (1972). Both organizations began in response to unusual environmental circumstances. SPSSI and Tavistock were influenced by events during and after World War II. Social and behavioral scientists were intimately involved with the war effort, which encouraged scientists from various disciplines to work together and to develop practical answers to multifaceted problems. Multi-disciplinary efforts continued for a time after the war until falling to disciplinary pressures, funding crises, etc.

Both organizations were deeply influenced by Kurt Lewin. Lewin met the requirement outlined by Griffith and Mullins for an exceptional leader of a specialty group. Lewin was brilliant and charismatic. His theories were groundbreaking and radically different from the mainstream. Lewin used special language in his theory that sprang from different epistemological roots than mainstream psychology. Lewin placed an indelible stamp on SPSSI and Tavistock. His work formed a crucial part of the theoretical underpinnings of the two societies. In the case of SPSSI, his influence

is quite visible while Lewin's influence is less overt with Tavistock. Membership in both organizations is based on interest in and acceptance of the goals of the societies and their theoretical models. Members of the specialties have many different disciplinary homes, a fact that is celebrated and encouraged by the specialties. Therefore, a common orientation or discourse is vital for group coherence and cohesiveness.

Griffith and Mullins (1972) point out that successful groups generate "tribal folklore" and customs. The "Lewin stories" (e.g., Trist's "conversion" to Field Theory) and recounting of one's genealogical relationship to Lewin (e.g., "I am a second generation Lewinian" by Raven in *JSI*) illustrate Lewin's place in the culture and mythology of the organizations. SPSSI institutionalized its allegiance to Lewin by creating the Kurt Lewin Award that is given annually to an individual who exemplifies the aims of Lewin and SPSSI. The award recipient's address is published in *JSI.*

Griffith and Mullins (1972) also describe the various fates of activist groups. Some fail as they become too large and ties are diluted. Some achieve their goals and move on to other problems. Others are institutionalized and become part of the intellectual mainstream. Another somewhat related fate is to find that a different group takes up the specialty's issue or problem area. SPSSI and the Tavistock Institute became institutionalized although both have undergone periodic crises that necessitated realigning the organizations. One way they have coped with change is by adhering to their metatheoretical roots, largely Lewinian theory, while changing their aims. The organizational shift is visible in their journals.

Human Relations moved from a focus on action research, sociotechnical systems and systems analysis in its early days to publishing largely applied business and organization research today. *HR* describes its aim as bringing theory and practice across the social sciences—"to relate social theory to social practice." Over fifty years later these are still the projects to which the journal devotes itself along with attending to developments in organizational theory and action research" (Sage Publication web page). The early editors of *HR* were psychoanalysts whereas contemporary editors have organizational and business backgrounds.

JSI remains likewise committed to its social justice addenda but the problems have changed from diversity issues regarding African-Americans to Arabs-Israelis, from gender equality to equality for physically disabled, and so forth. SPSSI experienced a crisis stemming partially from the development in the American Psychological Association of other liberal/radical divisions and interest groups. These newer groups are more specialized than SPSSI and siphon off some of the potential members, which is a phenomenon occurring in a number of professional societies.

Small Group Research is the example Mullins (1972) analyzed for a group that failed to become a specialty in sociology, partially because of Lewin's untimely death. The results of this research indicate that the subject of small group research was absorbed into several different specialties such as Organization Studies (visible in *Human Relations*) and action research (visible in *JSI)*. The evidence for this assertion is that the major authors associated with small group research are highly cited in these journals. Lewin emphasized the importance of combining laboratory experiments and fieldwork but these became separated, as laboratory experiments

became the province of Social Psychology and the practical application-oriented work became associated with Organization Studies, Business, Education, and Social Work.

In summary, specialty groups are important objects of study in scientific communication. The problem of defining a specialty's boundaries can be difficult. Studying the citations of articles published in the specialty's journal provides a window to the intellectual interests of the specialty. Such articles have passed the editors, who are the gatekeepers. Scholars can examine the citations published authors use as a means to generate maps of the intellectual terrain for the specialty. The Society for the Psychological Study of Social Issues and the Tavistock Institute meet the criteria for successful specialties outlined by Griffith and Mullins. Their respective journals, *Journal of Social Issues* and *Human Relations*, are vehicles for exploring one view of the specialties' intellectual landscapes. Membership in the specialties is multidisciplinary and based on acceptance of the organizations goals and theoretical foundation. Lewin was a critical figure for both specialties, particularly in that his work provides much of their theoretical underpinnings. Tracing Lewin's citation image over time revealed the changing intellectual terrain of the specialties. The usefulness of this finding is discussed in the next section.

The importance of context

This research dealt with formal communication in the social sciences and investigated portraying intellectual structure for social science journal communities. The social sciences can be problematic at times for cocitation analysis because of the importance social scientists attach to differences in practical approach and theoretical

stance. A number of authors have described this identifying characteristic as "organizing around a founder," or as "tribes," or as "discourse communities." Collins (1994) predicted that the social sciences would never develop the type of consensus that occurs in the natural sciences. Using the example of philosophy he states the discipline is "structured socially by the intergenerational networks that connect eminent philosophers with each other" (p.157). This research asked if combining this characteristic with cocitation mapping increased understanding of a journal community's intellectual structure.

Cocitation analysis aims to capture a group of citing authors' collective mental model of a subject and judgments of interrelationships of previous literature. However, Delamont (1989) found that members of one faction regularly ignore the research produced by members representing other factions. As might be expected, researchers found that at times aggregate cocitation maps, while accurate, do not correspond well with social scientists' mental maps. Sometimes they do correspond very well (McCain, 1989; McCain et al., 2003; Buzydlowski, 2003). An expert viewing a map may find he or she knows individuals on one portion but not other areas of the graph. Or an expert may criticize the map because it does not correspond with his or her views, which is not surprising given the fractionalized nature of many social science specialties.

This research was aimed at generating a map corresponding to the "insider's" view. One way to increase the focus or specificity of cocitation maps is to create maps that acknowledge the importance of theoretical and/or methodological orientation to social scientists and to incorporate "orientation" into the map. This

research attempted to incorporate the idea of a specialty's founder as a marker indicating orientation and thus, as a portal to access the intellectual landscape. The notion of a founder as marker for orientation is akin to Small's (1982) idea of cited works as concept symbols.

White's (2000) contribution of ego-centered citation analysis offers a method of generating cocitation maps based on a single author's name that illustrate facets of the focal author's intellectual life. Ego-centered cocitation analysis is an advance for researchers interested in studying a particular author or in applying the notion of a founder as marker for orientation. Lin, White, and Buzydlowski (2001) combined ego-centered citation analysis with vastly improved mapping in their AuthorLink program.

In my research about Lewin, however, a minor modification to the protocol was necessary in order to maintain the focus on Lewin. Adding a contextual filter to the data retrieval procedure enabled the creation of maps containing authors with ties to Lewin as seen in their appearing with Lewin in reference lists. The maps produced in this manner displayed the "Lewinian" focus in the array of subject clusters and the content of the articles. The subject content of the clusters represented the range of Lewin's and the sponsoring specialties' research interests and showed movement over time as authors appeared, faded, or became more prominent. In these cases, due to Lewin's importance to the specialty, the Lewin filter generated maps that were a surrogate for the array of subjects covered in the journal. The relationship between intellectual and social ties is another feature of the filtered maps related to Lewin's citation image.

The relationship between intellectual and social ties

A number of researchers have investigated whether a relationship exists between citation data and social relationships or between intellectual and interpersonal ties with a general consensus that some relationship exists between them (White, Wellman, & Nazer, 2004; Lievrouw, 1990). White, Wellman, & Nazer (2004) studied intercitation, communication, and social network data for a group of human development researchers in order to explore connections between them. They found, among other things, that cocitation is a significant predictor of intercitation in journal articles and covaries with time and roles within the group. Shadish et al. (1995) found interpersonal ties in their study of authors' reasons for citing. Forty-six percent of responding authors in three psychology journals reported that they have social contact with the people they cite. Forty-five percent of the authors spoke directly or on the phone with the person they cited, 18% of the respondents considered the citee a personal friend, 10% of the citees worked at an institution where the author trained, and for 9% of the respondents the cited author was a colleague at their institution. The researchers were unable to determine whether respondents who had such contact had different citation practices from those who did not. They concluded that apparently authors have social contact with the individuals they cite.

Many of the authors cocited with Lewin had interpersonal ties of some kind with Lewin and with each other. A few authors repeatedly cocited with Lewin in both journals, such as Cartwright, Festinger, and French, were Lewin's students and colleagues. Many of the authors either received their doctoral degree and/or worked

at a few key institutions. Cronin and Shaw (2001) in their examination of three authors' citation images and citation identities reported the effect of working in the same institution. The citation images and citation identities of the information scientists they studied "are powerfully reflective of not only intellectual but also social and institutional connections." They also observed the "mesh of collegiate and mentor-adviser relationships inscribed in [their] data" (p.137).

The *JSI* authors, in particular, were often from the University of Michigan's Institute of Social Relations, which is where Lewin's Research Group for Group Dynamics moved after his death. The University of Southern California also has strong connections to Lewin. The organizer of the most recent Lewin conference is on the faculty there, as are a number of *JSI* authors. Information on the authors writing in *HR* was not as readily available although it was not surprising that there is a strong connection to the Tavistock Institute. A number of adviser-advisee relationships were revealed when I examined all the authors in the articles citing Lewin, which is one of Mullins' (1977) characteristics of successful specialty groups. The appearance of adviser-advisee relationships in the literature is consistent with Clements and Wang's (2003) study of Ph.D. students' works. These researchers found that students tend to cite authors from their own institutions, especially their supervisors.

Although the issue of the correspondence between citation ties and interpersonal ties was not part of the research questions in this study, it is an area that seems obvious to pursue in the future. Perhaps employing a contextual filter in social science specialties will yield a focused map of intellectual ties that will correspond to interpersonal connections. The use of the contextual filter enriched this research's

data set so that experimenting with lower inclusion thresholds than usually recommended in cocitation studies did not invalidate the maps but instead enabled names to appear that are important in understanding intellectual and social ties in the sponsering specialties.

Totems and concept symbols

This research attempted to augment the portrayal of intellectual structure for two social science specialties by incorporating citation context analyses. Previous research suggested that accounting for the function of citations might yield additional useful information about a specialty. In the two journal communities studied, expectations about citation function were not met. The results obtained were consistent with the ACCA maps, which showed Lewin's work continuing to be used in substantive ways. In the journals studied here Lewin may be "George Washington" as the editor of *JSI* indicated but he is not solely a totemic figure. The concept of totemic citation as defined here did not necessarily correspond with iconic status.

It is possible that Lewin's work is used more frequently in a totemic manner in journals without such a strong connection to Lewin. Perhaps the format of articles published in *JSI* and *HR* do not lend themselves to the type of citation practices Hargens found. On its web page *JSI* states its goal is "the communication of scientific findings and interpretation in a non-technical manner but without sacrificing professional standards." *HR* describes itself as aiming toward "the integration of the social sciences." The Guidelines for submission of contributions in *HR* state, "studies based on laboratory experiments are normally unacceptable unless presented with

confirming field data. Studies referring to simulation exercises involving students or others without experiential knowledge of the simulated context are particularly discouraged."

There is a range of opinions in published literature about Lewin's influence on social science. Statements claiming that Lewin is largely irrelevant are clearly wrong although application of Lewin's work has shifted over time. McGrath's (1999) comment, that social psychology has become focused largely on laboratory experiments that have little connection to the action research agenda so important to Lewin, is indicative of this movement. The application of social psychological theory and research found a congenial home in Organizational Studies, the inheritors of Group Dynamics research. When Mullins (1972) looked at the fate of Lewin's small group research theory group in sociology, he found that it died. If, however, one examines settings, such as MIT's Sloan School or the Institute for Social Science Research at the University of Michigan, Lewin's work is continuing. This raises the importance of conducting cocitation studies that can capture the change over time that occur in the use of an author's work. As can be seen with Lewin's work there has been considerable movement in the journals that cite Lewin.

The aforementioned Clements and Wang (2003) study of Ph.D. students' works found that they tend to cite authors from their own institutions, especially their supervisors. This is hardly surprising but raises the issue of the socialization process of students into the culture of an academic department. Students learn, among many other things, the discourse sanctioned by their "tribe" They also learn that part of the acceptable discourse is who to cite. White remarked that a scholar cites his "guru"

and his "guru's guru." Collins (1994) referred to the communication of knowledge across generations. Thus, we return to the question of schools of thought or "tribes" in transmitting the intellectual culture of the group to initiates. Capturing the "tribe" in maps would be an advance in the usefulness of cocitation analysis. This study was a step in that direction.

Relationship between cocitation analysis and citation context analysis

The conventional basis for citation analysis is that an author cites previous work that provides information pertinent to the citing author's document (Wilson, 1999). This argument for citation analysis is often the only one agreed upon as authors argue about more complex meanings of citation behavior. Liu's (1993) review of citation studies details the numerous studies of the complexities of citation practice and analysis of citation function/citation context. The cumulated studies make it clear that citation practices vary across disciplines and specialty groups. Beyond that, however, many researchers created their own classification schemes. This research combined previously successful classification schemes for the analysis of citation function. I found it necessary to modify the pre-existing schemes because the theoretical/conceptual article prevalent in the *JSI* and *HR* did not fit. This highlights the difficulty in probing citation context or function and its relation to cocitation analysis.

In her extensive review Wilson (1999) discusses the criticisms of citation studies and the counterclaims made in defense of its validity. She notes that mapping of literatures by other methods, such as co-word analysis, subject expert opinion, etc,

sometimes does not agree with maps produced by citation analysis. In their study of citations to source papers, Maričić et al. (1998) found no congruence between citations and evaluation of citation context. Results of procedures, such as card sorting and other knowledge elicitation techniques do correspond to maps (Buzydlowski, 2003; McCain, 1989). Wilson concludes that neither cocitation mapping nor alternative methods are privileged by default. One can reasonably conclude that different measures produce different perspectives of a subject as Marion and McCain (2001) found in comparing indexer vocabulary assignments and author cocitation choices. In this research the results of the citation context analysis support the cocitation context maps. Lewin's work is very useful to authors in two journals with Substantive citations occurring more frequently than Totemic citations.

Shadish et al. (1995) found that authors in three psychology journals cited works because such works are "exemplars" and have "higher quality" than non-cited works. Shadish et al. found different reasons for choosing to cite older and newer works. Older works may be cited by virtue of their role as an exemplar even though they are thought to be theoretically or methodologically outdated and not be high quality by contemporary standards. An example might be Milgram's "obedience to authority" experiments that sparked ethical concerns about treatment of human subjects. Lewin's work is apparently judged differently than many older works because citing authors used the work in a substantive or central relevant to their research. Much more research is needed to interpret the relationship between citation context and cocitation analysis.

Conclusions

These conclusions are based on two case studies of journals sponsored by specialties associated with Kurt Lewin. The results of the cocitation context analysis and the analysis of citation function provided support for the idea of using a contextual filter to generate focused author cocitation maps in the social sciences. When using a contextual filter the researcher can work with lower inclusion thresholds than is usually recommended. The results of the analysis of citation function supported the findings of the pilot study and the cocitation maps. Contrary to expectation, Lewin was not a totemic figure as defined in this study. His work continued to be used substantively by authors over time. *JSI* and *HR* authors chose to cite works of Lewin that paralleled the subject of most interest to the specialties. *JSI* cited *Resolving Social Conflicts*. *HR* most frequently cited *Field Theory in Social Science: Selected Theoretical Papers.*

Research Question 1: Contextual Author Cocitation Analyses of Intellectual Structure

The first question asked whether cocitation context analysis could create maps of intellectual structure that bring into focus the "Lewinian" perspective of a journal community. The goal of this research question was to determine what intellectual structure emerges from author cocitation context analyses of authors derived from citations to Lewin in two journals, *Journal of Social Issues* and *Human Relations*. The procedures created coherent and complementary views of intellectual structure depicting the array of topics Lewin researched. The maps had a definite "Lewinian" focus. Citing authors chose other authors whose work is congruent with Lewin's

work. The "Lewin filter" meant that authors who are highly cited for a variety of topics were cited within the context of work that had some affinity for subject convergent with Lewin's work.

I experimented with inclusion thresholds for author names because I had questions about whether low cocitation counts distorted the results of the individual journal maps. In fact, the second map obtained from the *Journal of Social Issues* data was different than the first map. The results from the revised author list did not invalidate the first map. The second map was an enhanced view of subjects corresponding to the topics of Lewin's work.

The results for the second journal, *Human Relations*, did not change very much after I set an inclusion threshold and analyzed smaller set of authors cocited with Lewin. The most highly cocited authors continued, for the most part, in the same clusters. The authors who disappeared from the revised list were on the periphery of the map. This was an expected outcome because authors with the least similarity in their cocitation profile to others in the data set are placed on the periphery of the map.

These "micro-level" analyses successfully portrayed the intellectual milieu of a specialty's "founding father," Kurt Lewin in this case, as seen by writers citing Lewin. Using the author cocitation context technique generated a focused data set of authors and led to a nuanced perspective of intellectual structure. The experiments with different inclusion threshold demonstrated yet again the caveat that cocitation maps produce a snapshot with contents that vary according to the parameters set by the researcher. In that sense, cocitation maps do not produce "the picture" but rather "a picture." The maps created for *Human Relations* were typical in that if the

researcher raised the inclusion threshold authors on the periphery would be eliminated. The *Journal of Social Issues* maps were more interesting in that the two maps displayed two different, albeit complementary pictures, of intellectual ties among cited authors.

Research Question 2: Function of Citations to Lewin

The second (multipart) research question arose from Hargens' (2000) finding that behavioral scientists disproportionately cite classic works as "totemic representations." This type of citation is thought to signal the reader of the writer's intellectual orientation. "Totems" thus cited are the founders or central figures of the discipline or specialty. Accordingly, this question set out to determine whether analysis of citation function would increase understanding of intellectual structure. In order to clarify that question, several steps were undertaken.

Research Question 2a: Citation Context Analysis

The first part of this research question focused on calculating the frequency of Totemic and Substantive citations to Lewin in articles from the *Journal of Social Issues* and *Human Relations* in order to arrive at an assessment of how citing authors used Lewin's work. Based on published statements and the length of time since Lewin's death, my expectation was that authors writing in "Lewinite" journals would be likely to cite Lewin more frequently as a "totemic representation." "Substantive" citations to Lewin, defined as referring to specific methods and/or results, would

occur less frequently, but when they did occur, would indicate the portions of Lewin's work most useful in contemporary social science.

The coding scheme was based on previous research but was modified to reflect the articles found in the data set. It was necessary to add the class "Theoretical/Conceptual" to the "Research Reports" and "Review" classes because a number of articles presented a self-described "new framework" or "conceptual model" that often included brief descriptions of a program of research and/or theoretical formulations.

The results indicated that Theoretical/Conceptual articles comprised a substantial portion of the articles citing Lewin. The number of articles citing Lewin also differed from expectation. The number of *JSI* articles citing Lewin increased over the time studied while in *HR* the number stayed surprisingly steady. The increase of JSI articles citing Lewin reflects the two special issues—one celebrating the fiftieth anniversary of the Society for the Psychological Study of Social Issues and the second commemorating the fiftieth anniversary of Lewin's death.

When I compared the amount of Totemic and Substantive citations for each article class the results for both journals clearly depicted, with one exception, that Lewin's work was used substantively in both journals and in most document classes. Totemic citations frequently occurred as the single reference of Lewin's work whereas authors that used Lewin's work in a Substantive manner often had multiple Substantive references to Lewin. Authors citing Lewin found his work relevant and important in their own work.

Research Question 2b: Citation Function Over Time

The next part of the second research question arose from previous studies finding that the use of citations changed over time, shifting from a focus on specific results or techniques to a generalized acknowledgement of previous research. This suggests that totemism increases with the time between initial and later citations. I expected that, over the time studied in this research, use of citations to Lewin would not change greatly, again because of the time since Lewin's death.

When I examined how citation function changed over the three decades of this study I found that once again, with one exception, the total number of citations as well as the numbers of Totemic and Substantive citations increased over time. The proportion of Totemic citations in *JSI* and *HR* did not increase over time. In HR there was a steady decrease over the three decades whereas JSI experienced a slight increase in the middle decade followed by a decrease in the third decade. Again, this finding suggested that Lewin continued to be an increasingly important figure for authors citing Lewin in *HR* and *JSI*.

Research Question 2c: Lewin's Concepts Cited

According to published accounts, Lewin's work served as part of the intellectual foundation for several specialties. I wanted to ascertain which concepts citing authors find relevant for their work because such information might enrich understanding of Lewin's role in contemporary social science. I looked at Lewin's most frequently cited works as well as the concepts authors cited. Most of Lewin's ideas were originally published in journal articles, some in German. After Lewin's untimely

death, colleagues published several anthologies of what they believed to be Lewin's most important papers. Authors in both *JSI* and *HR* tended to cite the anthologies, rather than the individual paper that contained the concept being cited. It was consistent, given the social action orientation of SPSSI, that authors in *JSI* most frequently cited *Resolving Social Conflicts*. It was also congruent with *HR's* orientation toward organizational studies that authors citing Lewin most frequently cited *Field Theory in Social Science: Selected Theoretical Papers*.

The choice of these anthologies reflected not only the general subject content of the journals but also the concepts most frequently cited by authors in these journals. In *JSI* authors cited "action research," "field theory," and ""group dynamics" as umbrella terms. Key terms associated with the broader concepts, such as "methods of social change," "unfreezing," refreezing, and "force field" were frequently mentioned. In *HR* authors most frequently cited Lewin's concepts of "field theory" and "three phase model of planned organizational change." Specific key cited concepts include "democratic and authoritarian leadership styles," "model for organizational change," and "life space."

Research Question 3: Clarification of Lewin's Role

One anticipated result of this research was that the derived intellectual structures and analyses of citation function would resolve some of the disagreements found in published accounts. The initial ACCA of Lewin's citation image provided a "macro" view demonstrating that, over the period studied, he remained highly cited in several disciplines and was cited in new disciplines.

The results of this study clearly indicated that, for authors who cite Lewin in two journals, he remained an important source of theoretical and methodological ideas. Since Lewin was one of the most highly cited authors for each journal, it was reasonable to conclude that Lewin remains important for both specialties. These findings did not support those who write that Lewin's influence has diminished over time. On the contrary, Lewin was cited more frequently over the period studied. What has changed in some instances is the specific application of Lewin's ideas. For example, small group research and the study of group dynamics have shifted from Social Psychology programs to a home in Organization Studies departments. Sensitivity training groups (T-groups) are no longer in vogue but training programs for combating prejudice and discrimination remain important. These results, therefore, argue for tracking authors over time in order to make this kind of shift more visible.

Recommendations for Further Research

This research is two case studies organized around an unusual researcher and writer in the social sciences. The usual caveat about the inability to generalize from a single case to the population is valid here. Conducting similar studies based on other authors is necessary to confirm whether using a contextual filter is useful for studying other specialties. Also a study comparing maps generated with the standard cocitation protocol and with a contextual filter would be interesting. Members of a specialty could review the two sets of maps could be to determine their validity and what type of information is provided about the users' mental maps.

The question of the relationship between intellectual and social networks is receiving an increasing amount of attention from researchers as cross-fertilization between the citation analysis community and the sociometric community occurs. Thus far, the record of evidence for claiming the existence of definitive relationships between citation ties and social ties is inconclusive. The results from these journals are highly suggestive of corresponding social and intellectual ties. This avenue should be pursued to determine whether employing a filter to generate cocitation maps aids in interpreting ties and whether intellectual structures are congruent with social structures.

Small (1982) expressed an interest in tracking the path of a citation as it became a standardized concept symbol. That such a process occurs is without question but how and when does it happen remains unknown. In the present research citations used as concept symbols were categorized as totemic. Is there correspondence between the standardized concept symbol and the totemic use of a citation? Are they different properties of the same phenomenon or different ideas? Lewin's work could be traced in such a manner.

Summary

This exploratory study builds on an enduring line of research by many scholars investigating the communication pathways of scientific knowledge and the structure of scientific communities. The validity of cocitation mapping for representing the intellectual connections among scholars, their work, and journals is without question. As more research is completed that affords increasingly

sophisticated analyses of scientific groups, the value of cocitation mapping also increases. The focus here was on addressing a difficulty that can occur in mapping social science specialties because of their fractious nature.

When a researcher investigates the intellectual structure of a field with strong "schools of thought" or political divisions, he or she can compensate for such characteristics by setting search parameters and carefully choosing terms. This research experimented with the potential for employing a specialty's founder as a contextual filter, which parallels the founder's role as an organizing figure for the specialty. Results of two case studies indicate that generating such author maps is possible. The contextual filter enabled the researcher to employ White's ego-centered citation analysis to create a portrait that displays the range of subjects and authors important to that journal's sponsoring group.

Future research could expand on this study in several directions. First, one could compare experts' assessments of aggregated maps and contextually filtered maps in order to explore the mental maps held by the experts. Another direction for further research is applying author cocitation context analysis to other journals. The data was suggestive of close interpersonal connections among the citing authors and the cited authors. The intergenerational connections bear investigating.

This research also combined author cocitation analysis with citation context analysis. Lewin seemed to fit the characteristics of a totemic figure for the two journal communities studied just as the specialties appeared to possess the characteristics of a "tribe." I analyzed the function of citations to Lewin in the data set to determine whether the use of Lewin's work met the totemic citation criteria.

The results indicated that Lewin's work is not used merely to indicate the author's orientation. The citing authors frequently used Lewin's work in a substantive way, which is congruent with Lewin's status in the organizations sponsoring the journals studied. The number of articles citing Lewin was surprisingly steady over the thirty years studied and the use of Lewin's work continued to be central to the citing authors' papers. Future research could classify the use of Lewin's work in other specialties to determine whether totemic use is mediated by the conventions of particular journals or specialties.

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Appendix A. Pilot Study

A Tri-citation Analysis Exploring The Citation Image of Kurt Lewin

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This paper presents the initial phase of a comparison of cocitation and social network analysis methods for the study of scholarly communication. The subject is a case study of the intellectual contributions of the social psychologist, Kurt Lewin. Lewin's "citation image" is examined with an analysis of intellectual "fellow travelers" as viewed by writers who cite both Lewin and other authors. In this paper I report the findings of an author tri-citation analysis that explores the relationships among authors linked to Lewin by citations in the three ISI databases. Lists of the sixty authors most highly cocited with Lewin in two time periods (1972-1986 and 1987-2001) were derived and then explored with two multivariate techniques: cluster analysis and multidimensional scaling. Findings indicate the continuing diffusion of Lewin's ideas. Group Dynamics and Social Psychology clusters show a shift in members from the early period to the late. The later map shows the growing dominance of organizational development and business management. Although psychology remains a prominent arena for Lewin's ideas there is increasing divergence between the disciplines of psychology and organizational development.

INTRODUCTION

Domain analysis has been categorized as one of the major subdisciplines of information science (White & McCain 1998). Domain analysts use several families of methods, including several types of citation analysis, content analysis, and more recently, social network analysis to examine the structure of a discipline, the process of scholarly communication, and relationships among people, ideas and documents. These methods arose from different intellectual disciplines, sometimes use related measures, and generally seem to offer complimentary perspectives of the subject under study. Research that compares and contrasts these different methods is necessary in order to understand the potential contributions and limitations of each. This research reports results of a tri-citation analysis, the first part of a comparison of cocitation analysis and social network analysis methods. The subject of the study is Kurt Lewin (1890-1947), one of the pre-eminent social scientists of the twentieth century and widely regarded as the "father" of small group research (Gold 1999). The scope of Lewin's interests and contributions is quite broad: "philosophy of science; social, developmental, personality, motivational, cognitive, and clinical psychology; social organization; social problems; and scientific methodology" (Gold 1999, p. ix). My research is a case study of the influence of Lewin's ideas with the two-fold goal: deriving a comprehensive portrait of Lewin's intellectual contributions to science and comparing citation and social network analytic methods, particularly in the social sciences.

Lewin presents an interesting case for this type of study because of factors related to the nature of his contributions as well as the facts of his career. Lewin is widely known for the development of Field Theory and his experimental studies of

group climate and authority. He also developed the practice of action research, conceptualized the notion of cognitive structure, formulated the concept of the "information gatekeeper", and coined the statement "There is nothing as practical as a good theory", all of which are now part of the common vocabulary in psychology (Deutsch 1968). Many observers may be unaware that these innovations originated with Lewin because these contributions are widely associated with other authors or the ideas are so thoroughly assimilated into the literature that they are no longer cited. Garfield (1975) referred to this phenomenon as the "obliteration phenomenon," whereby one's ideas are adopted so completely into discourse that any connection with the originator is lost.

Lewin remains influential despite several factors that might be expected to limit his impact on science. Among these factors are: (1) Lewin died in 1947, so that his papers were originally published at least half a century ago; (2) Lewin immigrated to this country in 1933 from Germany so that early papers were largely inaccessible to English readers and his career in the United States only lasted about fifteen years; (3) Lewin never held a major professorial position; (4) Lewin tended to have his students list themselves as first author on papers. He would also initiate research programs that were carried on by his students while he turned to new research problems. It would not be surprising that, despite widespread influence, perhaps Lewin's citation counts do not reflect his impact on science. This is not to say that Lewin is not cited; indeed, he is cited approximately 6000 times in the Institute for Scientific Information (ISI) citation indexes.

The organizational psychologist Edgar Schein (1996) provides an example of the obliteration phenomenon: “Few people have had as profound an impact on the theory and practice of social and organizational psychology as Kurt Lewin. Though I never knew him personally I was fortunate during my graduate school years at Harvard's Social Relations Dept. in 1949-50 to have been exposed to Alex Bavelas and Douglas McGregor, who, in my mind embodied Lewin's spirit totally. … Lewin's spirit and the assumptions that lay behind it are deeply embedded in my own work and that of many of my colleagues who practice the art of ‘Organization Development.’ I have deliberately avoided giving specific references to Lewin's work because it is his basic philosophy and concepts that have influenced me and these run through all of his work as well as the work of so many others who have founded the field of group dynamics and organization development.”

Similarly Scott (1990), in recounting the history of social network analysis, describes how Lewin’s ideas provided one of the intellectual foundations for the development of social network analysis. Lewin’s work seems to undergo periodic revival. In 1997 the American Psychological Association published two of Lewin’s best known but out-of-print works, Resolving Social Conflicts and Field Theory in Social Science, as a single volume. In 1999 the American Psychological Association published a collection of Lewin’s papers, which were out of print or difficult to obtain (Gold 1999).

The purpose of this study is to first establish the breadth and depth of Lewin’s influence as exhibited by his “citation image”; that is, a picture of authors with whom Lewin is cited.

Subsequent investigations will apply social network analysis and content analysis methods to achieve the twin aims of comparing the contributions of these methods to the study of scholarly communication in the social sciences as well as to derive an understanding of Lewin's contributions.

METHODS

The first phase of the research (reported here) was to derive a cocited author analysis of Lewin's writings over time. The basic techniques of cocitation analysis are described at length in McCain (1990). This research represents a variation of the author cocitation research model in which pairs of authors are compared with each other. In order to trace Lewin's influence I performed an author tri-citation analysis using Lewin as a filter to construct maps of authors who are intellectually linked with Lewin. I could find no example of a tri-citation analysis in the literature (Note 1). These maps portray Lewin's "citation image"; that is, the aggregated consensus of numerous authors' views as rendered in reference lists (White & McCain 1998).

I used the Dialog One Search function to query the three ISI Citation Indexes: the Science Citation Index (Dialog File 34 and 434), the Social Science Citation Index (Dialog File 7), and the Arts and Humanities Citation Index (Dialog File 439). The initial search query, S CA=Lewin K, limited to one of the time periods, gathered the citations to Lewin for 1972 to 1986 and 1987 to 2001. I divided the time into two periods in order to derive a finer-grained view of Lewin's citation image and to determine whether change in the citation image occurred over time.

I then used Dialog's RANK command in order to derive for each period a list of the most highly cocited authors in the set in which Lewin is cited. The result was

two lists of the sixty authors who are most frequently cited with Lewin (See Table 1). Several authors who appear on the first list are absent from the list for the later period and are marked with an asterisk. Authors who appear only on the second list are in bold type.

Table 1. Ranked lists of authors highly cocited with Lewin

RANK No.	1972 - 1986	1987 – 2001
1	FESTINGER L	BANDURA A
2	BANDURA A	FESTINGER L
3	FREUD S	ARGYRIS C
4	PIAGET J	FREUD S
5	MISCHEL W	SCHEIN EH
6	ARGYRIS C	**LOCKE EA**
7	ROTTER JB	PIAGET J
8	ATKINSON JW	ALLPORT GW
9	TOLMAN EC	JAMES W
10	ALLPORT GW	**HIGGINS ET**
11	KATZ D	HEIDER F
12	CARTWRIGHT D	ATKINSON JW
13	SHERIF M	**MINTZBERG H**
14	HEIDER F	KELLEY HH
15	SKINNER BF	MURRAY HA
16	DEUTSCH M	**CARVER CS**
17	MURRAY HA*	**COHEN J**
18	CRONBACH LJ	**LAZARUS RS**
19	KELLEY HH	**TAYLOR SE**
20	GOFFMAN E	MISCHEL W
21	VROOM VH	SIMON HA
22	ERIKSON EH	**KAHNEMAN D**
23	PARSONS T*	**TVERSKY A**
24	CAMPBELL DT	**WEICK KE**
25	LAWLER EE*	SHERIF M
26	LIKERT R*	**TAJFEL H**
27	BARKER RG	**KANTER RM**
28	MEAD GH	KATZ D

29	MASLOW AH	WEINER B
30	JANIS IL	JANIS IL
31	ROGERS CR	JONES EE
32	MCGUIRE WJ*	ROTTER JB
33	ZAJONC RB*	**FISKE ST**
34	BENNIS WG*	GOFFMAN E
35	SCHEIN EH	VROOM VH
36	MCCLELLAND DC	**AJZEN I**
37	SIMON HA	**KUHN TS**
38	FRENCH JRP	ERIKSON EH
39	HOMANS GC	MCCLELLAND DC
40	MILLER GA*	DEWEY J
41	PORTER LW*	**HECKHAUSEN H**
42	WEBER M*	**MARKUS H**
43	BRUNER JS	MASLOW AH
44	JONES EE	CAMPBELL DT
45	KELLY GA*	MEAD GH
46	BRONFENBRENNER	HACKMAN JR
47	MERTON RK*	DEUTSCH M
48	WEINER B	BRONFENBRENNER
49	CATTELL RB*	SKINNER BF
50	FISHBEIN M	BARKER RG
51	MOOS RH*	ASCH SE
52	ROKEACH M	BRUNER JS
53	ASCH SE	ROGERS CR
54	BALES RF*	TOLMAN EC
55	SCHACHTER S*	MARCH JG
56	ENDLER NS*	**NISBETT RE**
57	HACKMAN JR	**SNYDER M**
58	BEM DJ*	CARTWRIGHT D
59	MARCH JG	CRONBACH LJ
60	OSGOOD CE*	FISHBEIN M

Names marked with an * indicate that author appears only on the first list.
Names in bold type indicate author first appears in the second list.

The authors appearing on the list from 1972 to 1986 include many of the most prominent writers in the social sciences. As one would expect, psychology is most heavily represented with canonical authors Freud, Skinner, Rogers, Maslow, and

Erickson. Sociology is represented with Parsons, Merton, and Weber. The discipline of organizational development appears with Schein and Argyris. Many of Lewin's students, such as Festinger, Cartwright, Deutsch, with distinguished careers in social psychology and group dynamics research, also occur.

It appears that considerable change occurred from the first period to the second. A number of names from the first list do not appear in the second list, new names appear and several authors' positions shift. This appears to reflect "rising stars" in the literature as well as Lewin's work being cited in different subjects than previously. For example, Schein, the organizational development expert, moved from position 35 to 5. New names include Mintzberg from business management, Tversky from economics, and Kahneman who publishes in both psychology and economics, at times co-authoring with Tversky. While some canonical authors in psychology remain prominent, there appears to be a shift from the discipline of psychology to business and organizational development. While this apparent shift may be significant, statistical tests were currently being conducted to confirm the appearance of significant change.

The names of the sixty authors on each list were "anded" with Lewin and with each other, again limiting the query to one of the periods and removing duplicate entries. A sample search statement is: S CA=Lewin K and CA=Deutsch M and CA=Allport G and PY=1972:1986; RD. This query searches the three databases for records in which Kurt Lewin and Gordon Allport and Morton Deutsch are jointly cited between 1972 and 1986 and duplicate records are removed. The resulting number of records is the raw tri-citation count for this author triad.

The resulting raw tri-citation counts were assembled in two 60 by 60 matrices of 3600 cells each. Correlations were calculated to determine the pattern of similarity between each author triad. The mean value for each of the sixty authors' off-diagonal tri-citation counts was inserted in the diagonal cell of the final tri-citation matrix (White & McCain 1998) and the raw tri-citation counts were converted to a proximity matrix – in this case a matrix of Pearson correlations that serve as measures of tri-citation profile similarity.

The use of correlations rather than raw tri-citation counts has the effect of compensating for large differences in citation counts for very high-profile authors. The two lists of authors include some canonical figures in psychology and the social sciences with extremely large citation counts, such as Freud, Skinner, Merton, and Simon, which make deriving citation

patterns particularly important. While large citation counts are themselves an indication of influence within a field, the present research is concerned with the intellectual structure; thus, a measure of cocitation profile similarity provides more useful information.

The structure of the correlation matrix was explored using two multivariate techniques: cluster analysis (SPSSX Cluster, complete linkage method) to identify clusters of authors with similar cocitation patterns; and multidimensional scaling (SPSSX ALSCAL, nonmetric option) to produce two- and three-dimension displays of the data (Norusis, 1997).

Thirty-nine authors appeared on both cocited authors lists. These authors were assembled in two dissimilarity matrices and further analyzed with a weighted MDS

procedure, also called individual differences scaling or INDSCAL, to determine whether the observed shift in disciplines from one period to the other could be confirmed.

FINDINGS

I will begin by presenting the results separately for each author list before discussing them. Many of the authors on the two lists are prolific writers, whose work is cited in many disciplines; however, the focus of this study is the judgment of writers who choose to cite Lewin along with the authors whose names appear on the lists in Table 1. Thus, the cluster labels reflect the subject matter of the articles in which the authors are cited, which is derived from an examination of the citing articles. In this manner, Freud, who wrote on a number of subjects, is cited for his work on child development, not clinical treatment.

Author List 1972-1986

Cluster Analysis

The cluster analysis is based on the pattern similarity (correlations) of the sixty authors in each time period who were most highly cited with Lewin in the ISI databases. The first author list 1972-1986 forms six coherent clusters with several sub-clusters that fall into two groups in their final clustering history (Figure 1). Group Dynamics and Social Psychology are two closely related sub-clusters that include many of Lewin's students. The canonical figures of Parsons, Weber, and Merton form a small cluster. It is hardly surprising that Psychology forms two coherent sub-

clusters with Skinner in one and Freud in the other. The sub-cluster with Skinner includes a number of authors, such as Cattel and Cronbach, who work in assessment. The sub-cluster with Freud includes developmental psychologists Piaget and Erikson. These clusters join into a large psychology / sociology cluster toward the end of the clustering.

The other large cluster forming at the last stage of the clustering algorithm is comprised of authors cited in the organizational development and business literature. The clusters in this group consist of a cluster concerned with Attitude, Achievement, and Motivation and a large cluster with three sub-clusters: Campbell and French whose work is cited in studies of social policy, especially regarding workers; a large Organizational Development cluster that includes Schein, Argyris, and Simon; and a sub-cluster with a focus on Organizational Behavior, Management, and Leadership. The final two groups that form are the large psychology cluster and the organizational development cluster, which most broadly reflects Lewin's intellectual interests.

Multidimensional Scaling (MDS)

The MDS map (Figure 2) shows the first author list in two dimensions. The optimal solution is three dimensions (R^2 = .92, stress = .1) but the third dimension is notably difficult to illustrate. Therefore, names anchoring the third dimension or Z-axis are underlined. The loops around groups of names represent the clusters from the cluster analysis.

The horizontal or X-axis points to a continuum from clinical psychologists, such as Freud and Skinner on the left side of the map to organization development /management consultants located on the right side. Lewin's students, Group

Dynamics, and Social Psychology are placed at the top of the vertical or Y-axis. Authors whose work on individual motivation, attitudes, and leadership is relevant to understanding management populate the bottom of the Y-axis. There are no names located in the middle of the map, whose work links to many others.

The names across the bottom of the map are a focus on the individual - from assessment with Mischel and Cronbach on the left, to authors like McClelland writing about achievement in the middle, to Maslow and Vroom cited for work in leadership and management. Across the top of the map is a clear orientation toward group behavior, including social problems, prejudice and intergroup relations. In this region we see Jones (stigma), Rokeach (dogmatism), Festinger (cognitive dissonance), Bales (interaction process analysis), and so forth. Interestingly, the clusters reflect the broad range of Lewin's major intellectual interests as outlined by Gold's (1999) discussion (above).

Author List 1987-2001

Cluster Analysis

The second set of sixty authors also forms six coherent groups that fall into two groups in the last stage (Figure 3). Psychology is again divided into two sub-clusters around Learning, Assessment, and Personality in one cluster and Cognitive and Human Development in the other. The Learning and Assessment cluster gained four members from the first cluster while the Human Development cluster gained three members. A notable shift is Goffman, who moved from the Social Psychology cluster in the early list to the Human Development cluster in the second. The Organizational Development cluster exhibits some shift in membership. The small

sub-cluster of Campbell and French from the first list has now separated as French remains with the Organizational Development group and Campbell (research design) joins canonical figures Dewey and Kuhn. Barker and Bronfenbrenner, both writing about Ecological Psychology, are united in a small sub-cluster.

The most visible shift occurs in the composition of the Group Dynamics and Social Psychology clusters. The membership of Social Psychology is reduced from nine to five members. Further, members Janis ("groupthink") and Festinger (cognitive dissonance) move to different clusters, the former to Organizational Development and the latter to a new cluster, Decision Making and Consumer Behavior. This latter cluster represents an arena for Lewin's ideas not visible in the previous cluster analysis. Newcomers to this group are Tversky and Kahneman, cited for their work on risk and decision-making. Interestingly, the authors citing Lewin and these other authors are writing about marketing and consumer behavior, which are, of course, very group-oriented topics.

Multidimensional Scaling (MDS)

The map for the second author group (Figure 4) is optimized in three dimensions ($R^2 = .92$, stress = .1) although only two dimensions are represented. The authors whose names are underlined anchor the third dimension (Z-axis). The loops around groups of names represent the clusters from the cluster analysis.

The algorithm placed the psychologist groups on the left side of the map and the organizational development authors on the right. The map is distorted by the requirement to contain the management / organizational development group on the

right. Consequently, the psychologists are confined to a small, crowded area on the left. Authors generally viewed as representing very different schools of thought, such as Skinner and Freud, are placed rather close together. The horizontal or X-axis represents the same continuum as the earlier map; that is, going from the individual psychology focus on the left to the group development focus on the right. The vertical or Y-axis is anchored by the group dynamics / social psychologists at the top and authors cited for their work on leadership and motivation on the bottom. The Z-axis seems to represent a continuum from microanalysis (Barker on family ecology) to macroanalysis (Dewey on education and Kuhn on paradigms).

COMPARISON OF EARLY AND LATE PERIODS

Weighted MDS

The thirty-nine authors who appear on both the Early Period (1972-1986) and the Late Period (1987-2001) lists were compared to determine whether there are different emphases given to the underlying dimensions of the data structure by the two sets of citing authors. Individual differences scaling performed jointly on data sets highlights the different perspectives on authors highly cocited with Lewin provided by authors writing in ISI indexed publications. The output of a weighted MDS analysis includes a summary display (map) of the best configuration when the input matrices are considered together and a set of weights that represents the different emphases given to the dimensions of the group subject space in the separate data matrices (Coxon 1982). Space constraints do not permit publication of the

summary display or the data coordinates for each of the data sets analyzed but Table 2 illustrates the comparative importance placed on dimensions of the stimulus space by citing authors in each period.

The INDSCAL dimensions represent the orthogonal directions where the variation among the matrices is greatest, which tends to make interpretation relatively easy. Results of the weighted MDS analysis confirmed the different emphases placed in the Early and the Late Periods (3 dimensions, RSQ=.90, stress=.13).

Table 2. Results of Weighted MDS Analysis: Comparison of Early and Late Periods

Data Set	*Weight Assigned To:*		
	Dim 1 (X)	Dim 2 (Y)	Dim 3 (Z)
1972:1986	.66	.19	.63
1987:2001	.42	.85	.24

During the period 1972 – 1986, citing authors emphasized two axes: Cognitive and Social Learning Theory to Organizational Development (Dimension 1) as well as the Group Dynamics and Dissonance Theory to Industrial/Organizational Psychology continuum (Dimension 3). The Y-axis, Organizational Development to Human Development and Socialization (Dimension 2), which represents business management, organizational culture and learning at one pole, and studies of child development at the other pole, was much less important. The opposite is true for the period 1987-2001. Although the Cognitive and Social Learning Theory to Organizational Development axis retained some importance to citing authors, the system–oriented Organizational Development to individually-oriented Human Development and Socialization (Dimension 2) became the aspect of the structure that

is most emphasized. The Z-axis, Group Dynamics to Industrial/Organizational Psychology, received much less weight.

CONCLUSIONS AND DISCUSSION

This research presents a picture of the citation image or the intellectual "fellow travelers" of Kurt Lewin, as evidenced by an analysis of pairs of authors who are highly cocited with Lewin and each other over a thirty year period. Although Lewin's work remains largely cited within the general discipline of psychology, there is evidence that he is increasingly cited in work that differs from psychology, especially from clinical psychology. Authors writing about topics such as management, decision-making and risk analysis find Lewin's work relevant. As the earlier quote from Schein indicates, the Organizational Development group is seen by others and to some extent, themselves, as heirs of Lewin's ideas. Lewin believed that the appropriate way to study an individual is in his interrelationships to the groups of which he is a part, that group climate can influence productivity, and many other ideas that management and organizational development specialists find especially cogent.

Lewin's students, who appear in the Social Psychology and Group Dynamics clusters, are found far from the center of the maps, which would indicate a lack of links to many other authors. The distance from the center for this group increased from one time period to the next. One could speculate that social psychology is losing its connection with the applied disciplines of management and organizational development. It appears that some of Lewin's students focused on one of his precepts, which was to stress the importance of experimental research while many of the

management / organizational development heirs focus on the value of "action research", which is very different than the controlled laboratory experiment.

An article by Ford (1999) makes a similar argument. Ford offers an analysis of small group research carried out with "traditional" social psychology; i.e. experimental methodology. He points out that he is an "organization management researcher" and his research "as is the case with most members of [his] field, is based on an eclectic blending of concepts from multiple disciplines that span across levels of analysis and the use of a broad range of quantitative and qualitative research methods. Ford also has "little investment in the conventions that guided [the other authors'] research." Additionally, Ford refers to an article by McGrath (1997), which urges social psychology to broaden its research methods and include a focus on contextually-sensitive environments. Finally, Ford expresses "disappointment that important contributions from researchers in the management field have yet to be incorporated into basic small group research". Thus, although Lewin clearly wrote about the importance of basic laboratory research to inform applied research and vice versa, it seems that the groups have largely ceased to consult with each other.

Tri-citation analysis offers a fresh perspective on an author, especially when the subject is very influential and highly cited. Tri-citation analysis provided a picture of the intellectual partners of Kurt Lewin and their relationship to each other. It appears that in the short space of thirty years the use of Lewin's ideas has shifted a great deal with increasing divergence among the authors with whom he is cocited. The next steps in this research project are: to confirm whether the apparent shifts in authors' positions is significant; to explore the interrelations relationships of Lewin's

associates and students by means of Social Network Analysis, and to trace the diffusion of several key Lewinian concepts like “gatekeeper” and “action research”.

NOTE

1. Katherine W. McCain suggested the use of tri-citation analysis in this context.

ACKNOWLEDGMENTS

I wish to thank Katherine McCain and Howard White for their valuable advice and support of this project.

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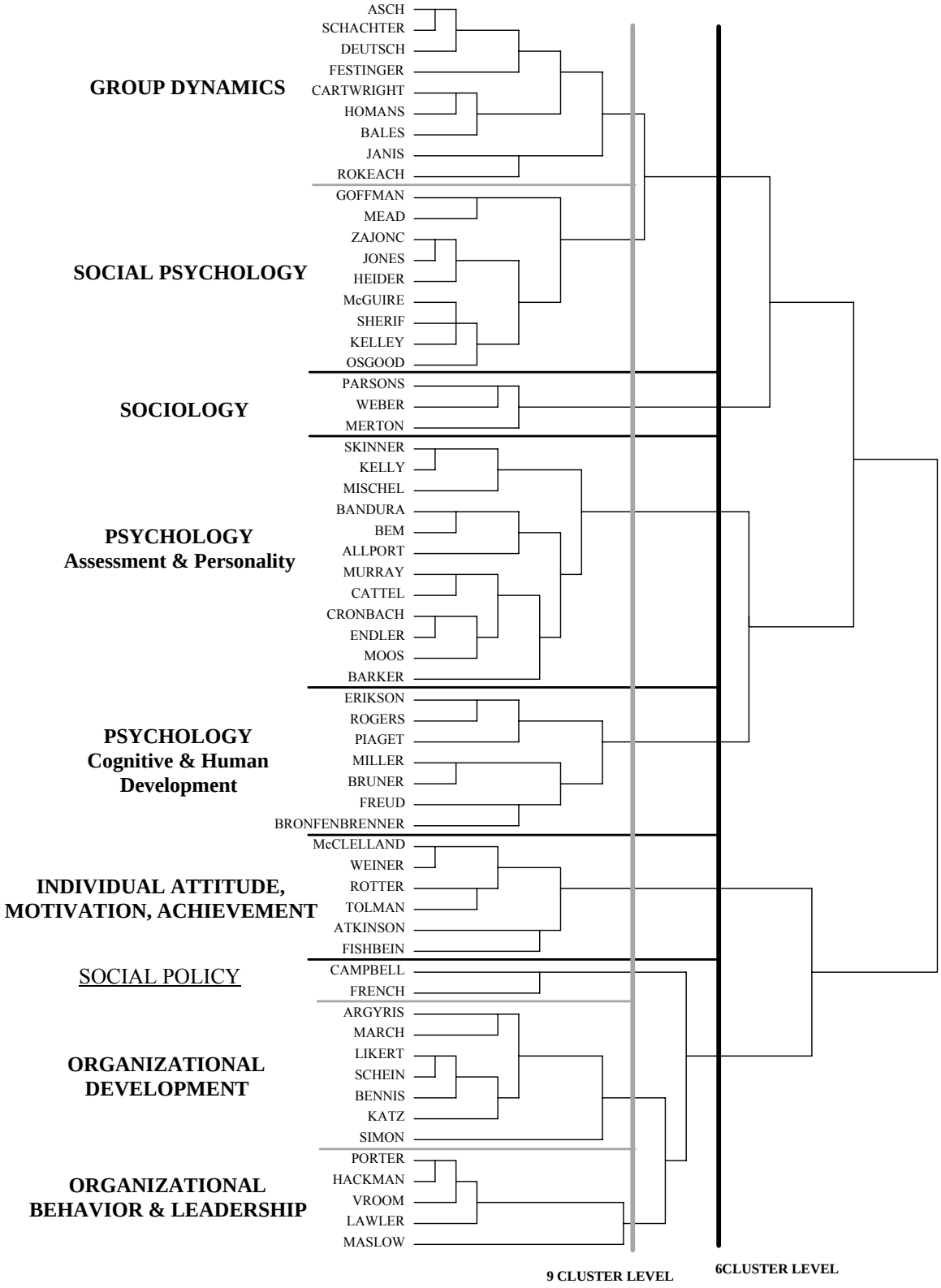

Figure 1: Cluster Analysis--60 authors cocited with Kurt Lewin, 1972 - 1986

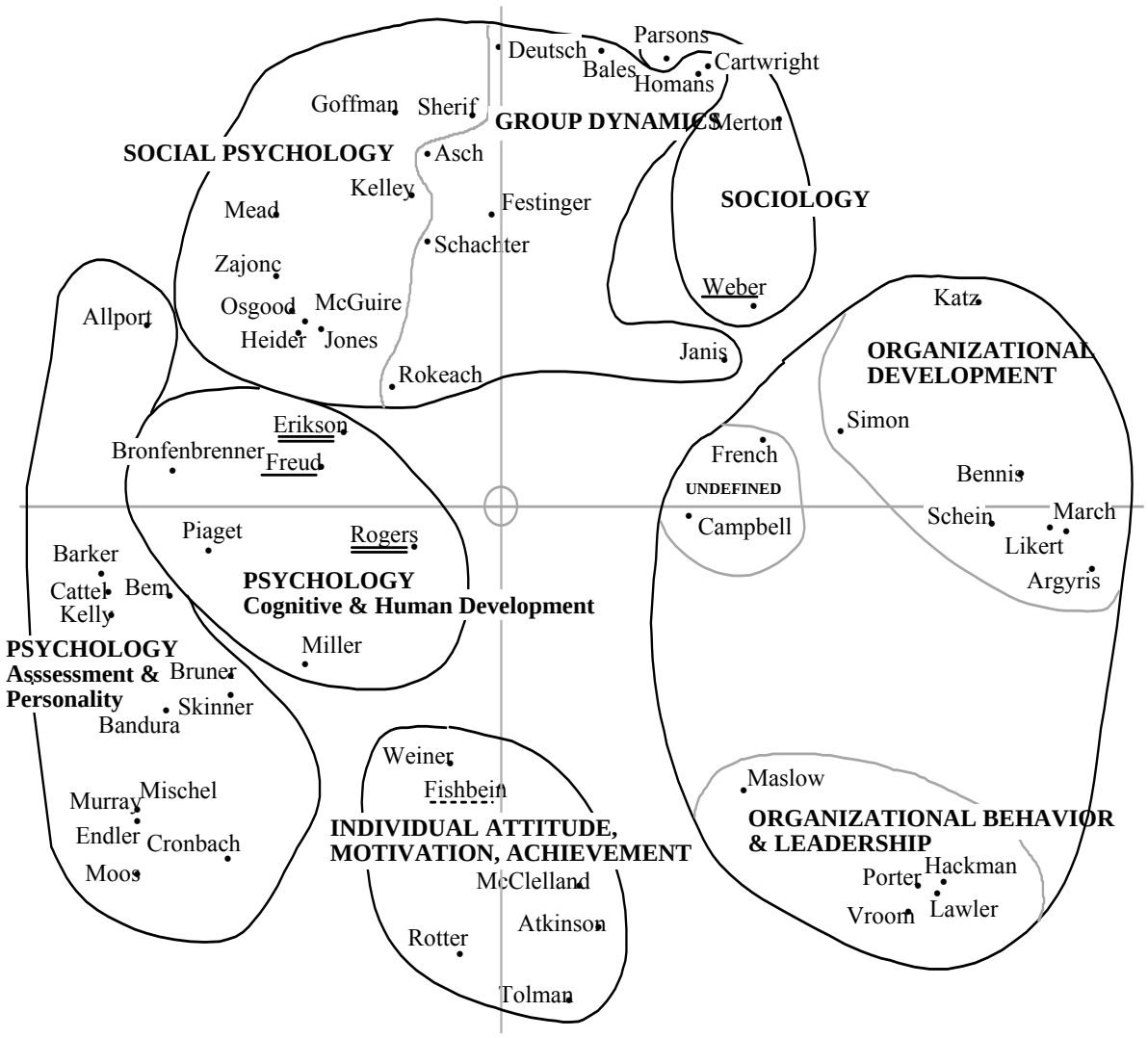

Figure 2: MDS MAP--AUTHORS COCITED WITH KURT LEWIN 1972 - 1986. Dimensions 1-2 of a 3 dimension solution.

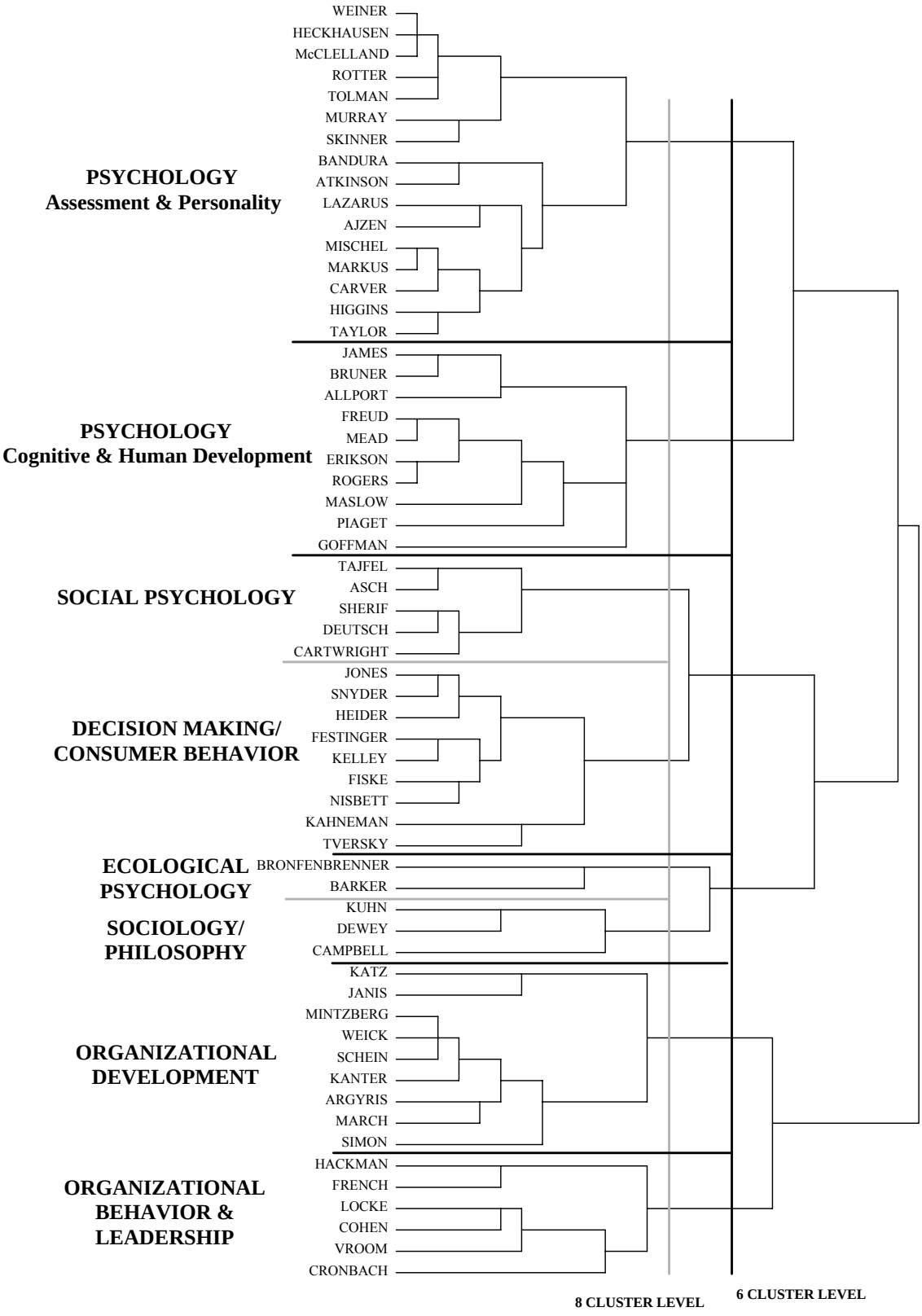

Figure 3: Cluster Analysis--60 authors cocited with Kurt Lewin 1987 - 2001

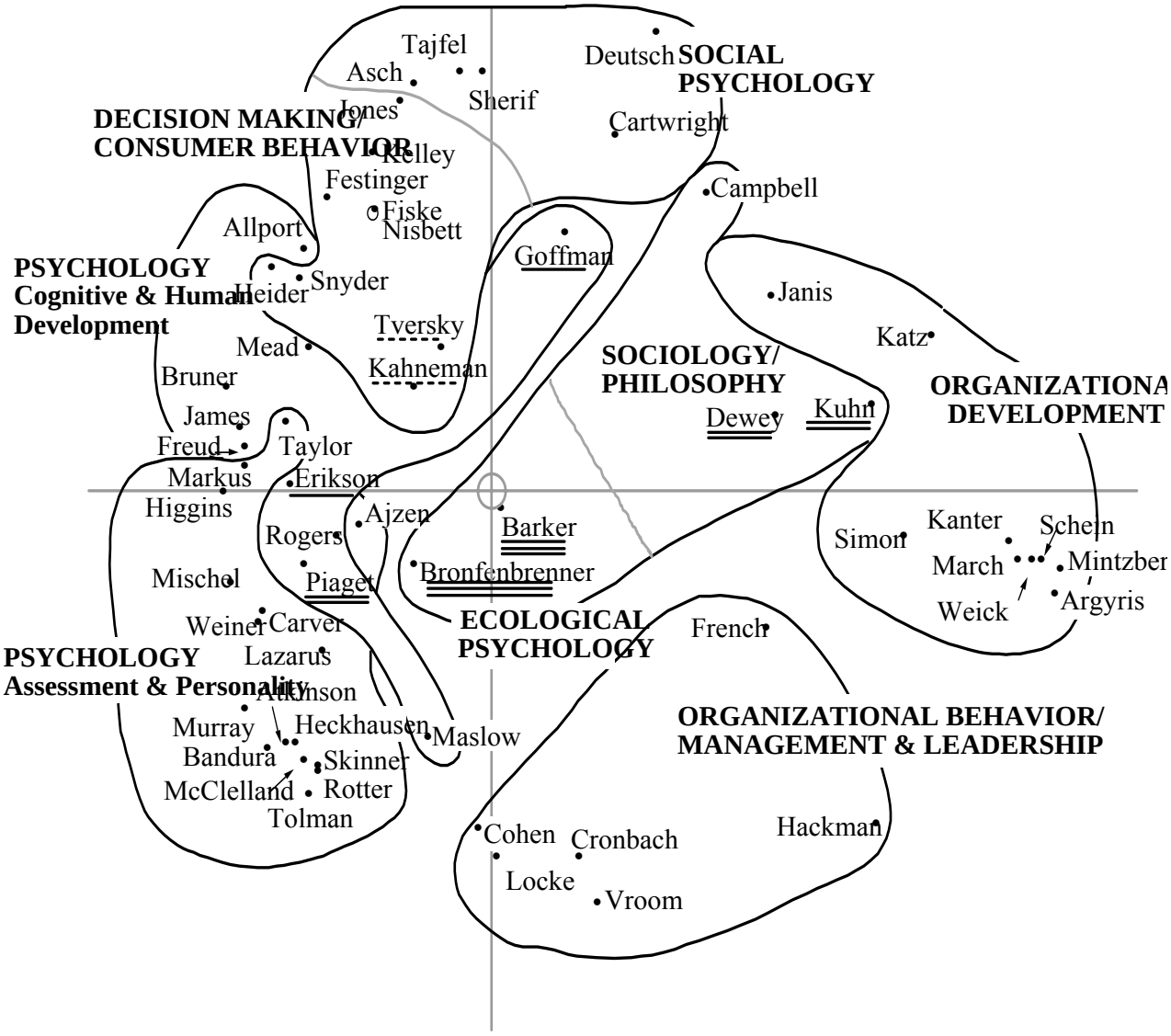

Figure 4: MDS MAP-- COCITED AUTHORS LINKED WITH KURT LEWIN 1987 - Dimension 1-2 of a 3 dimension solution

Appendix B. SPSS Command Syntax for Cluster Analysis

```
PROXIMITIES
deutsch cartwrig festinge tajfel allport lippitt french sherif campbell
katz berkowit janis kelman moscovic raven rokeach bandura barker
jones kelley milgram piaget aronson brewer bronfenb byrne fiske
mcgrath murphy newcomb asch coch dollard hovland kohlberg
langer merton
 /MATRIX OUT ('C:\windows\temp\spssAU.tmp')
 /VIEW=VARIABLE
 /MEASURE= CORRELATION
 /STANDARDIZE= NONE .


Cluster
 /matrix in ('C:\windows\temp\spssAU.tmp')
 /method complete
 /print schedule
 /print distance
 /plot dendrogram
```

Appendix C. SPSS Command Syntax for Multidimensional Scaling

```
Alscal
  Variables= deutsch cartwrig festinge tajfel allport lippitt french sherif campbell
 katz berkowit janis kelman moscovic raven rokeach bandura barker
 jones kelley milgram piaget aronson brewer bronfenb byrne fiske
 mcgrath murphy newcomb asch coch dollard hovland kohlberg
 langer merton
  /matrix in ('C:\windows\temp\spssAU.tmp')
  /shape=symmetric
  /level=ordinal (similar)
  /condition=matrix
  /model=euclid
  /criteria=converge(.001) stressmin(.005) iter(30) cutoff(-1) dimens(1,3)
  /plot=default.
```

Appendix D. SPSS Command Syntax for Factor Analysis

```
Factor
 /Variables deutsch cartwrig festinge tajfel allport lippitt french sherif campbell
 katz berkowit janis kelman moscovic raven rokeach bandura barker
 jones kelley milgram piaget aronson brewer bronfenb byrne fiske
 mcgrath murphy newcomb asch coch dollard hovland kohlberg
 langer merton
  /Analysis deutsch cartwrig festinge tajfel allport lippitt french sherif campbell
 katz berkowit janis kelman moscovic raven rokeach bandura barker
 jones kelley milgram piaget aronson brewer bronfenb byrne fiske
 mcgrath murphy newcomb asch coch dollard hovland kohlberg
 langer merton
  /print initial extraction rotation
  /format sort blank(.40)
  /plot eigen
  /criteria mineigen(1) iterate(100)
  /extraction pc
  /criteria iterate(100)
  /rotation oblimin
  /method=correlation.
```

Appendix E. An Intellectual Biography of Kurt Lewin (1890-1947)

It is difficult to understand the significance of Kurt Lewin in social science (and Lewin as a concept symbol) without some explanation of the context in which he developed his theories and techniques (which is itself a Lewinian concept.) This brief essay first describes the competing intellectual traditions that struggled for dominance in the new discipline of psychology during the first half of the twentieth century. It was during this period that Lewin was instrumental in developing some of the important theoretical and applied approaches that determined the discipline's path. The next section of the essay presents the background for Lewin's major theoretical contributions. This essay has several sources, including the *International Encyclopedia of the Social Sciences* (1968, 2001), *The Capitalist Philosophers* (2000), *The Practical Theorist* (1969), and *The Roots of Modern Social Psychology* (1996), as well as commentary by Martin Gold, Gordon Allport, and Dorwin Cartwright in anthologies of Lewin's papers.

Competing Views of Psychology

At the end of the nineteenth century, psychology developed both as a natural science and as a social science accompanied by a great deal of conflict about the appropriate nature and place for this new discipline. Many commentators have described the struggle for intellectual dominance in early twentieth-century psychology as a battle of competing schools of thought. The competing schools differed about whether to limit research to directly observable, measurable,

physiological data or to include less directly observable data, such as self-perception, environmental factors, values, and consciousness. Those who favored limiting psychology to directly observable phenomena developed into the Behaviorist School while those who advocated studying a broader range of subjects developed first as the Gestalt School and later evolved into the discipline of Social Psychology. The competition among these competing traditions has been more or less resolved only in the 1950s by the rapid fragmentation of psychology into numerous specialties and by institutionalizing differences between divisions of the American Psychological Association (APA). This "unity through division" is rebalanced annually when APA members vote to reallocate representation to various substantive (experimental, clinical, etc) and geographic (US states or Canadian provinces), thereby deciding the relative weight (votes) each division has in the APA Council of Representatives.

The Behaviorist Tradition

Wilhelm Wundt is credited with founding psychology as an experimental science. Trained as a physiologist, Wundt maintained that psychology was neither wholly a natural science nor wholly a social science. He asserted that the mind could not be separated from its social and cultural context, but he also denied that experimental methods were sufficient to study higher mental processes, such as thinking.

A number of Wundt's students wanted to establish psychology as a natural science and set out to prove that the psyche could be studied experimentally. Their argument was that in order to be a natural science, psychology must adhere to the principles that are basic to such sciences, including the principle that the data studied

must be public, i.e. observable and replicable by more than one person. Wundt's students believed the goal was achievable if they limited themselves to the study of the organism, the brain. These scientists extended apparatus-driven experimental techniques from sensation and perception to memory and thinking.

Wundt had opposed premature efforts to apply laboratory techniques in real-world situations, but a group of his students chose to pursue this avenue of research. They conducted studies that assessed the truthfulness of witnesses' court testimony, measured the performance of schoolchildren at different times of day, and tested the skills of industrial workers. Thus, for some psychologists, the science of the mind became the science of behavior. A number of Wundt's American students returned to the United States and opened laboratories in American universities that carried on this tradition.

In the United States Watsonian Behaviorism came into psychology as a protest against structural psychology (structuralism). Structuralism asserted that the purpose of psychology is to understand the mind and consciousness and that the road to such understanding is the introspective method. John B. Watson proclaimed in 1913 that behaviorism excluded consciousness altogether from psychological science in favor of prediction and control of behavior. It rejected both mental states and physiology as determiners of behavior, and asserted that theories of learning are unnecessary. In his later writings Watson advocated Pavlovian conditioning as a form of social engineering to be applied, for example, to raising children. Watson and his followers crusaded for the elimination in psychology of any reference to consciousness, mind, or self.

The 1930s were dominated by competing versions of neobehaviorism. B. F. Skinner developed operant conditioning in the 1930s, producing careful measurements of the relative likelihood of simple behavioral responses such as rats or pigeons pressing a bar to obtain a food pellet under rigorously controlled conditions and without any efforts to explain such behavior. The controversy over behaviorism arose not as much from the proposal that the science of psychology should study behavior, as it did from Watson's and his followers' insistence that it should study nothing else.

The Gestalt Tradition

The second, explicitly humanistic philosophical tradition, with competing conceptions of the subject matter, method, and practical uses of psychology, continued to develop in Germany. This second tradition had roots in the neo-Kantian movement, led by Ernst Cassirer, which challenged the literal empiricism of the experimentalists. The neo-Kantian position was that if one can conceive of something, it has a kind of existence or reality. This idea grew out of Kant's phenomenalism, which stated that sensate organisms are not directly in touch with reality but are aware indirectly through the perceptual processes by which they interpret the input from their senses (Gold 1999, p. 9). The scientist, therefore, should not be limited to only phenomena that can be directly observed. According to Cassirer, if a concept is useful for constructing a causal hypothesis, one should proceed to create it, define and describe it, and as soon as possible, find a way to measure it. Lewin was Cassirer's student and was greatly influenced by his ideas.

Scientists, who agreed with Wundt's assertion that the mind could not be studied separately from its environmental context, pursued a different course of research than that of the behaviorists. The Gestaltists reasoned that an approach that fails to include some of the most obvious aspects of human experience (e.g., perception, learning, values) could not be scientifically correct. The Gestalt, or holistic perspective, is that the whole is not simply the sum of its parts but is different from the merely aggregated sum of the parts. They saw perception as occurring in organized wholes in contrast to the atomistic, reductionistic approach followed by many psychologists, thereby challenging the fundamental assumptions of positivistic behaviorists.

The Gestaltists chose a phenomenological approach to perceptual organization, thinking, memory and association. The Gestalt view does not question the role of past experience in behavior but stated that the environment also contributes to experience. They supported the claim that actions and judgments are subjectively determined. This placed the Gestaltists and later the social psychologists in direct conflict with Behaviorists. The Gestaltists developed the idea of a "field" in which organized conscious behavior is accompanied by a physiological energy pattern, forming part of a larger energy pattern. Their focus on the physiological aspect of human behavior reflects the perspective of Wundt. Lewin was both influenced by and is considered one of the leading Gestalt psychologists. Lewin's conception of field, however, differs, especially in its removal of any reference to the physiological element. Lewin defined the "field" in purely psychological terms.

Behaviorism captured both expert and popular attention in the United States in the 1920s, with different versions competing with each other. Internationally,

behaviorism was hardly taken seriously until after 1945. Gestalt psychology and other initiatives from Germany were received with interest but also with skepticism in other countries. Psychoanalysis had established itself as an international movement by the 1920s, but acquired few academic adherents at the time.

Hitler's rise to power led to the exodus of Jewish academics from Germany. Many of the prominent Berlin Gestaltists, including Lewin, came to the United States and the Gestalt movement became part of the history of American psychology. They encountered Behaviorism, the dominant theory for American academic psychologists. The ongoing struggle with the atomistic behaviorists was transferred to America, except that here the behaviorists dominated academic psychology. The result was that many of the European émigrés had considerable trouble finding academic employment. Many found employment at elite institutions, like Swarthmore and Smith, without graduate schools. As a result, the emigres did not have a cohort of doctoral students to develop into the next generation of Gestaltists.

Social psychology, with its concern for the interaction of individuals in and with their environment, was greatly influenced by the Gestalt approach. The Gestalt influence was seen in the development of cognitive social psychology and in the applied fields of education, management, and social work. Lewin was particularly influential in bridging between the German Gestalt School, enlivening the rapidly developing field of social psychology, and leading social psychology's application to education, social services, social change, and management.

Lewin's Major Contributions

Lewin was a German Jew who studied philosophy of science under Carl Stumpf, the Director of the Psychological Institute in Berlin, who became the patron of the Berlin School of Gestalt Psychology. In Germany Lewin was a maverick in several respects. He studied subjects, such as human motivation, emotions, and aspiration that were considered highly unorthodox. He also accepted women, many of them Jews from Eastern Europe, as students. Lewin was also the only member of the Berlin Gestalt group who was interested in industrial management and child psychology. Lewin wrote a critique of Taylorism in 1920 in which he argued for psychologists and efficiency experts to work together to make work both more productive and more satisfying. He also observed children's behavior, often capturing it on film.

The influence of Cassirer and the Gestalt School had a lasting impact on Lewin's theory and research, although he extended both. In true neo-Kantian and Gestalt fashion, Lewin created theory that was not simply the sum of previous theories but was different than them, reflecting Lewin's own experiences. While in Germany Lewin focused on individual psychology but once in the United States Lewin's research shifted to the study of groups.

Cartwright credited Hitler with founding Social Psychology—first in motivating psychologists to contribute to the war effort, and second, because of the consequences of Nazism. Influenced by the overt anti-Semitism he experienced in Germany and later in American academia, Lewin pursued a social science that was actionable, that could help to create a better life with greater justice for all members

of society. World War II and the encounter with behaviorism led Lewin to become a social psychologist. His concern to make social science actionable led to and was embodied in action research.

Field Theory

Field Theory is the overarching label for the theory developed by Lewin and his students. Lewin described field theory as metatheory or a method for analyzing causal relations and building scientific constructs. "Topology" is a term Lewin originally used but later discarded in favor of "field theory." The main components of Lewin's metatheory and methodology are found in three books, *A Dynamic theory of Personality* (1935), *Principles of Topological Psychology* (1936) and *The Conceptual Representation and the Measurement of Psychological Forces* (1938); two anthologies reprinted as one volume by the American Psychological Association, *Resolving Social Conflicts and Field Theory in Social Science* (1997), and a third anthology, *The Complete Social Scientist* (1999).

The essential thesis of Field Theory is that scientific data should be classified according to a "constructive method." The constructive method starts with the view that behavior is the outcome of interaction of a number of elements in psychological space, such as positions and forces. Scientific laws based on these elements should deal with the underlying forces that energize and shape behavior and are, therefore, termed "dynamic." Lewin believed that analysis should begin with consideration of the entire environment in which the behavior occurs. This environmental situation is

considered as it (subjectively) exists for the individual rather than as a (objective) physical stimulus described by the experimenter.

Lewin summarized his theoretical stance with the equation B=f(P,E), which indicates that behavior is a function of the interaction of the person and his/her environment in a situation termed the "life space." The life space is divided into regions, paths and barriers, all of which constitute a field of forces. Some forces attract the individual (positive valence) and some forces repel the individual (negative valence). Lewin represented life space with diagrams that his students labeled "eggs" or "bathtubs." Lewin posited that individuals and groups typically exist in a homeostatic or state of quasi-stationary equilibrium. In order to effect change, the homeostatic balance must be upset. Lewin's oft-cited stage model for planned organizational change is derived from this basic concept. The stages in Lewin's model are unfreezing (creating disequilibrium), moving or changing, and refreezing (creating new balance). Lewin insisted that if one wanted to understand a situation, one should try to change it. These concepts were easily transferable to different units of analysis, from individuals to whole societies. In this way, Lewin's formulations were a metatheory or a perspective with which to view the psychological world.

Group Dynamics and Action Research

Leadership Styles

Lewin and his group developed a hands-on, learning-by-doing approach to conducting research and changing group behavior. One of Lewin's most highly cited studies occurred in the 1930's at the University of Iowa's Child Welfare Research

Station. Lewin, in conjunction with Lippitt and White, organized boys into three different groups each led by a college student. The leaders were instructed to behave according to authoritarian or democratic leadership styles. One of the leaders did not follow the democratic leadership instructions. Lewin coined the phrase laissez faire leadership to describe that leader's apathetic and non-directional style. The results, which have been replicated numerous times with different subjects in different settings, were startling. The democratic groups were tolerant, generous, and conscientious. The authoritarian and laissez faire groups produced frustration and cynicism in the boys. The boys in the authoritarian groups were also either very obedient or very destructive. Lewin found that the group and the individual were inextricably connected. Lewin and Lippitt coined the term "group dynamics" to describe the phenomena they observed.

Gatekeepers

Lewin was acquainted with Margaret Mead, with whom he discussed the (above noted) findings on leadership style. Mead and Lewin cooperated on a research project that was aimed at reducing the civilian consumption of meat during World War II and instead encouraging the increased consumption of typically less desirable foods. Lewin discovered that housewives were the gatekeepers in making food-purchasing decisions for their families. Housewives were divided into two groups. One group listened to an expert lecture them on the food they should buy while the second group were given the facts and asked to achieve a consensus. The latter group's food-buying habits were significantly changed. The lecture groups habits did

not change. Lewin's conclusion, which later served as the basis for many types of participatory management models, was that people are likely to modify their behavior when they participate in analysis of the problem and the development of its solution. People are likely to carry out decisions they helped make.

Research Center for Group Dynamics

Douglas McGregor, author of *The Human Side of Enterprise,* founded the Industrial Relations Department at MIT in 1937. McGregor is regarded as the first industrial psychologist to emphasize the strategic importance of personnel policies, and the role of culture, systems and training. The Sloan School of Management's Industrial Relations section employed influential theorists and practitioners in management and psychology. Lewin was the first of McGregor's recruits. McGregor and Lewin shared an interest in applying psychological theories to real human problems. In 1946, he helped Lewin launch MIT's Research Center for Group Dynamics, which moved to the Institute of Social Relations at the University of Michigan after Lewin's death. Other notable figures at MIT were Edgar Schein, Alex Bavelas, and Warren Bennis

In the 1930s and the 1940s, there was considerable interest in both the US and Britain in the dynamics of small group behavior. One outcome of this interest was the founding of the journal *Human Relations* immediately after the war as a joint venture between the Research Center for Group Dynamics (RCGD) at the University of Michigan and the Tavistock Institute of Human Relations in London. Lewin was the

link between the two groups. For instance, Lewin profoundly influenced Trist, one of the founders of Tavistock. The first issue of Human Relations was dedicated to Lewin and posthumously published his paper "The frontiers of group dynamics."

The Tavistock Institute became interested in small groups during the war. A shortage of psychiatrists to treat wounded led Bion and a few others to develop group psychotherapy and to organize the "treatment" of battle-fatigued soldiers on the basis of a self-directed hospital community. Bion was a psychoanalyst and Tavistock was an innovator in the development of a fusion of group psychotherapy, psychoanalysis, small group dynamics, and action research. Very early on *Human Relations* published several classic papers by Lewin's students, such as Festinger and Schachter.

Intergroup Relations and Action Research

T-groups

Lewin's interest in issues of social conflict, prejudice and discrimination continued to increase as a result of World War II and events that transpired after the war. Lewin saw clearly that the problems of all minority groups had similar underlying dynamics and that solving such problems meant working both with the oppressed and the oppressors. He began to devote more time to such efforts. In 1946 racial conflicts developed in several northern cities in the United States. A Connecticut state agency, with assistance from the National Education Association (NEA) and funding from the National Conference of Christians and Jews, asked Lewin to provide discussion leaders for a conference on race relations. Lewin and several students led small groups to train the discussion leaders and accidentally

stumbled on the idea of participant-observation. As a correction for leader/experimenter bias in groups, the small group members were invited to share their perceptions of the training sessions. This new type of group, which Lewin called training groups or T-groups, was a new method for treating social problems, not treating individual pathology.

National Training Laboratories

The Office of Naval Research and the Carnegie Foundation funded further research on T-groups. Lewin's ideas of small group dynamics and action research led to creation of a division of the National Education Association (NEA), which was called the National Training Laboratories for Group Dynamics (NTL). Lewin suggested finding a retreat for training, which took people away from their customary environment. NTL found space for summer workshops at an academy in Bethel, Maine. Lewin died suddenly of a heart attack shortly before the first session was held in 1947. Many of the most prominent organization scholars, such as Argyris and Schein, were students and/or trainers at Bethel. NTL developed into an organization separate from the NEA. In the 1960's conflicts about power and discrimination, ethnic and racial identity, and gender equality led to a shift in the organization. Many of the former stars, such as Schein and Argyris, withdrew from participation.

Commission on Community Interrelations (CCI)

At the same time that Lewin was developing the Research Center for Group Dynamics, in 1945 he also created and launched the Commission on Community

Interrelations (CCI) for the American Jewish Congress. The CCI's purpose was to ameliorate prejudice and discrimination through programs of action research. Lewin and CCI were concerned about anti-Semitism as well as prejudice against African-Americans, Catholics, and Asians. Lewin insisted that the research conducted by CCI should not only find out which methods were successful in changing people's prejudices but should also see that its results were put into action.

In summary, Lewin was influenced by the neo-Kantian Cassirer and the Gestalt School in Berlin during his education and early career but went on to develop his own theory that retained the orientation of his antecedents but was, in many ways different from them. Lewin was interested in applying theory to real-life situations and particularly wanted to improve the situation of people who were often powerless or overlooked. In Germany where he studied individuals' mental life apart from physiological processes, Lewin was considered one of the leading Gestalt psychologists. When Lewin immigrated to the United States to escape the Nazis, he became involved in the study of groups and action research. He continued to develop his theory until his sudden death.

Appendix F. Stimulus Coordinates—60 Authors Cocited with Lewin in *JSI*

DEUTSCH	0.4876	0.1185
CARTWRIG	-0.0362	0.3795
FESTINGE	0.8508	-0.0041
TAJFEL	1.0013	-0.5741
ALLPORT	0.7154	-0.3194
MARROW	-1.7374	0.8185
LIPPITT	-1.1615	0.9391
FRENCH	0.1983	0.9412
SHERIF	0.5253	-0.032
CAMPBELL	0.4108	-0.012
KATZ	0.0754	0.0629
BERKOWIT	0.7096	0.2917
JANIS	0.5426	0.0621
KELMAN	0.7008	0.0906
LEWIN	-2.4836	0.6336
MOSCOVIC	0.6179	-0.3567
RAVEN	0.2604	1.1516
ROKEACH	0.8738	-0.2199
WHITE	-1.0142	1.274
ZANDER	-0.3805	0.1813
BANDURA	1.0636	0.1014
BARKER	0.4734	1.0546
JAHODA	-1.3765	-0.1652
JONES	0.7528	-0.0388
KELLEY	0.6193	0.095
MILGRAM	0.8989	0.1831
PETTIGRE	1.0952	-1.2123
PIAGET	1.6044	-0.2098
AMIR	0.3731	-1.5567
ARONSON	0.3522	0.1643
BREWER	1.2655	-0.6561
BRONFENB	1.0844	-1.205
BYRNE	0.7238	0.2094
FINE	0.0085	-1.4271
FISKE	0.9996	-0.4934
GRAEBNER	-2.6117	0.5929
HARRIS	-3.7293	-0.9677
KIPNIS	0.511	1.4187
MCGRATH	-0.1781	0.0404
MURPHY	-0.5081	-0.4627
NEWCOMB	0.1723	-0.0758
APFELBAU	-0.1758	-0.8282
ASCH	0.4322	0.0283
BARGAL	-1.6648	-0.4061
CAPLAN	0.0912	1.593
CAPSHEW	-2.5066	-1.6772
CHEIN	-0.7146	-0.148

Appendix F. Stimulus Coordinates—60 Authors Cocited with Lewin in *JSI (cont.)*

COCH	-0.4907	1.2263
COOK	-0.4046	-1.6502
DERIVERA	-0.4286	0.8519
DOLLARD	0.5663	-0.735
FINISON	-3.1508	-0.7239
GAMSON	0.2375	0.7451
HOFFMAN	1.7959	0.0707
HOVLAND	0.203	-0.0751
KANTER	0.5947	0.7288
KOHLBERG	1.5572	0.568
LANGER	1.4799	0.1977
MERTON	0.1799	0.0545
SAMELSON	-2.3518	-0.6365

Appendix G. Stimulus Coordinates—45 Authors Cocited with Lewin in *JSI*

Stimulus Number	Stimulus Name	1	2
	DEUTSCH	.7450	-.4977
	CARTWRIG	.9805	.2773
	FESTINGE	.4705	-.8175
	TAJFEL	.2192	-1.4929
	ALLPORT	-.2826	-.6291
	MARROW	1.3248	2.2384
	LIPPITT	1.1756	2.1447
	FRENCH	1.2087	.8907
	SHERIF	.4302	-.6674
	CAMPBELL	-.2198	.0461
	KATZ	.9745	.2586
	BERKOWIT	-.1822	.0457
	JANIS	.4068	-.2155
	KELMAN	.3630	-.3754
	MOSCOVIC	.6885	-1.1045
	RAVEN	1.7416	.2162
	ROKEACH	-.7024	-.2874
	BANDURA	-1.1103	-.4938
	BARKER	-2.1993	1.3310
	JONES	-.0055	-.7311
	KELLEY	.2895	-.5788
	MILGRAM	.2442	-.7070
	PIAGET	-2.2492	.1093
	ARONSON	.3385	-.3791
	BREWER	-.0444	-1.7594
	BRONFENB	-2.5242	1.0070
	BYRNE	.3497	-.3684
	FISKE	-.2201	-1.3199
	MCGRATH	.6073	.7570
	MURPHY	-.6729	.5339
	NEWCOMB	.5594	-.2155
	ASCH	.5489	-.5879
	COCH	1.5128	1.7614
	DOLLARD	-1.3711	.0693
	HOVLAND	.6700	-.2279
	KANTER	-.4766	1.7629
	KOHLBERG	-2.5110	.5483
	LANGER	-1.1294	-.8457
	MERTON	.0517	.3042

Appendix H. Stimulus Coordinates—60 Authors Cocited with Lewin in *HR*

Stimulus Name	Dimension 1	Dimension 2
ARGYRIS	.9281	.3067
WEICK	.5242	.7440
HACKMAN	-.8379	1.1111
TRIST	1.6511	.3238
BENNIS	1.1105	-.5915
LIKERT	.0680	.4168
EMERY	1.4468	.1407
FRENCH	-1.4922	-.0616
KATZ	-.2058	-.1401
HOUSE	-.6786	1.2631
LAWLER	-.7355	.9380
VROOM	-1.1421	.8471
FESTINGE	-1.6180	-.9711
SCHEIN	.6246	.0800
BION	.6026	-2.1699
COHEN	-1.8922	.5972
MINTZBER	.6559	.7973
PORTER	-.9174	1.0980
RICE	1.8470	-.6961
ACKOFF	1.5536	-.5349
MARCH	.4433	.6488
MCCLELLA	-1.9536	-.2645
CAMPBELL	-.6099	-.6038
COCH	-.2020	.3671
LIPPITT	.6283	-.9532
MASLOW	-1.2793	-.4197
THOMPSON	.7178	.9173
WALTON	.9097	.3670
BLAKE	.8927	-.5265
BURNS	1.2274	.6688
DEUTSCH	-1.2060	-1.4479
KANTER	.3239	.2639
LOCKE	-1.5367	.5050
PFEFFER	.2285	.9744
SIMON	-.3673	-.2897
WHYTE	.9231	-.4183
ASHBY	.7068	-1.3879
HERBST	2.0299	.3143
JAMES	-1.1638	1.5787
JANIS	-.8443	-.5801
LAWRENCE	1.2800	.3995
MORGAN	1.2398	-.0407
PERROW	.6752	.7297
PETTIGRE	.6369	-.7163
SCHNEIDE	-1.1939	1.4453
ALDERFER	-.2179	.6927
BANDURA	-2.1033	-.3462
BECKHARD	1.3566	-.1610
CARTWRIG	-.9284	-1.4543

Appendix H. Stimulus Coordinates—60 Authors Cocited with Lewin in *HR (cont.)*

FIEDLER	-.7585	.2497
FREUD	-1.5384	-1.6331
GOFFMAN	-.7162	-1.5208
HEDBERG	1.4082	-.4966
HERZBERG	-.2337	.6835
KUHN	-.1397	-1.1063
LEAVITT	.6428	.1395
MCGRATH	-1.3699	-.0173
MILLER	2.0492	-.3277
MURRAY	-2.2984	-.6656
PUGH	.8482	.9336

Appendix I. Stimulus Coordinates—45 Authors Cocited with Lewin in *HR*

Stimulus Name	Dimension 1	Dimension 2
ARGYRIS	1.4412	-.1225
WEICK	1.0051	.0189
HACKMAN	-.2590	1.2319
TRIST	1.6282	.1412
BENNIS	1.1376	-.7931
LIKERT	.5270	.3609
EMERY	1.4719	.0126
FRENCH	-1.5117	.0257
KATZ	.2771	-.4316
HOUSE	-.0812	1.4159
LAWLER	-.2429	1.0321
VROOM	-.7235	1.1758
FESTINGE	-1.8843	-.6911
SCHEIN	.8870	-.3175
COHEN	-1.5526	.8918
MINTZBER	1.1701	-.2922
PORTER	-.3888	1.2042
MARCH	1.1164	.3688
MCCLELLA	-1.9207	.2170
CAMPBELL	-.5853	-.7268
COCH	.0591	.3430
LIPPITT	.6557	-1.3635
MASLOW	-1.3945	.2612
THOMPSON	1.3758	.6499
WALTON	1.2720	.0721
BLAKE	1.1035	-.8925
BURNS	1.7124	.0079
DEUTSCH	-1.3008	-1.5050
KANTER	.7336	-.3839
LOCKE	-1.2023	.8654
PFEFFER	.9476	.7216
SIMON	-.0337	-.3124
WHYTE	.9628	-.7890
JANIS	-.8225	-.6157
LAWRENCE	1.6956	.0509
PERROW	1.2332	.4877
BANDURA	-2.0192	.2799
CARTWRIG	-1.0434	-1.4402
FIEDLER	-.4588	.6098
FREUD	-1.8280	-1.0109
GOFFMAN	-.9383	-1.6047
HERZBERG	.1839	.9211
LEAVITT	1.0982	-.2057
MCGRATH	-1.2906	.2403
MURRAY	-2.2128	-.1093

Vita

Education

B.S.	Temple University	Social Work
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M.S.	Drexel University	Library & Information Science

Experience

Research Associate:

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Librarian:

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Annenberg Library; University of Pennsylvania; Philadelphia, PA.

Instructor College of Information Science & Technology, Drexel University:

Graduate courses: Information Resources & Services I & II, Professional & Social Aspects of Information Services

Undergraduate courses: Information Organization, Evaluation, & Use, Strategic Uses of Information, Information Systems Lab I & II

Publications (partial list):

Marion, L. (2002). A tri-citation analysis exploring the citation image of Kurt Lewin. In E. G. Toms (Ed.), *Proceedings of the American Society for Information Science,65th Annual Meeting, Philadelphia, November 18-21, 2002,* (pp. 3-13). Medford, NJ: Information Today, Inc.

Marion, L. (2001). Digital librarian, cybrarian, or librarian with specialized skills: Who will staff digital libraries? In H. Thompson (Ed.), *Crossing the Divide: Proceedings of the Tenth National Conference of the Association of College and Research Libraries, March 15-18, 2001, Denver, CO.* (pp. 143-149), Chicago: American Library Association.

Marion, L. & McCain, K. (2001). Contrasting views of software engineering journals: Author cocitation choices and indexer vocabulary assignments. JASIST 52(4): 297-308.

Honors:

Member Beta Phi Mu International Honor Society
Belver C. Griffith Memorial Doctoral Research Award
Association of College & Research Libraries Student Research Award