

An approach to identifying consensus in a subfield: The case of organizational culture[☆]

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Abstract

Most researchers recognize the importance of social interactions in the creation of scientific knowledge and new paradigmatic approaches. Nevertheless, methods summarizing major paradigms in a field, such as traditional literature reviews, divorce knowledge generation from its highly social context. Based on the assertion that knowledge is generated in part through social interactions among researchers, we introduce a cognitive network approach to identifying areas of consensus in a scientific subfield. This approach involves using a combination of social network analysis and textual map analysis techniques to locate points where meanings and people congregate. We illustrate this approach by examining the literature in the organizational culture subfield. Analyzing 70 texts in the organizational culture area, we use textual map analysis to identify changes in the conceptualization of culture over several decades and social network analysis techniques to changes in the key actors over this same period. We find that consensus within this field has evolved over time and is shaped by the social structure of researchers in the culture field. We discuss the potential contribution of this technique for providing insight into the process by which paradigms become established in organizational theory in particular, and research communities in general. © 1999 Published by Elsevier Science B.V. All rights reserved.

1. Introduction

The importance of paradigmatic consensus in organizational science is a topic of much discussion. Some scholars argue that consensus is essential to the advancement

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of scientific knowledge (Pfeffer, 1993). According to this perspective, consensus among researchers on the basic definitions and concepts that characterize a field is a prerequisite for resource allocation and a high frequency of publication which are in turn needed for scientific advancement. A set of elite gatekeepers should be established to direct the development of this consensus. Conversely, other scholars assert that the social nature of science precludes realization of paradigmatic consensus (Cannella and Paetzold, 1994; Van Maanen, 1995). Furthermore, critics argue that such consensus is undesirable as it would encourage conformity to paradigms potentially dictated by external interests (i.e. conforming to the paradigms held by funding sponsors). Consensus will be transitory, and it will emerge on occasion from the underlying ongoing interactions among scientists.

Both perspectives recognize the importance of social relationships on the generation of knowledge and consensus. In fact, many researchers have argued that the structure of a community influences the diffusion of new information and the ability of the community to achieve consensus (Granovetter, 1973; Rogers, 1983; Kaufer and Carley, 1993). Crane (1969b) has referred to the community of scientists working in a subfield as an 'invisible college'. Crane cites studies indicating that scientists working on similar problems are usually aware of each other. These scientists form social organizations based upon shared communications and shared interpretations of the situation. Mutual interaction is not only necessary for the development of consensus; but, such interaction should co-evolve with consensus and the development of shared mental models (Kaufer and Carley, 1993). Within science, mutual interaction influences productivity (Crane, 1969a: 348). Since social ties are conducive to the exchange of information, the greater the degree to which scientists in a field are linked, the more the rapid growth in the field (Crane, 1969a).

Therefore, to understand the development of a scientific field, we need to simultaneously look at knowledge and interaction. However, popular methods of summarizing paradigms in fields of inquiry, such as standard literature reviews, attempt to classify theories detached from any social context. Consequently, they cannot be used to understand the role of the social context in the development of consensus. They cannot, for example, be used to determine whether or not, or when, gatekeepers are necessary for consensus formation.

In this paper we present and illustrate a methodological approach for tracking the development of scientific fields. We refer to this methodological approach as literature analysis. A literature analysis identifies empirical regularities and changes in the texts and citation patterns of researchers in a field over time. In other words, a literature analysis looks simultaneously at social relationships and knowledge at multiple points in time.

Literature analysis involves three tasks. The first task is the identification of shared meaning through textual analysis. This is done by locating the concepts and interconnections among those concepts used by the various authors. Are there concepts in this field that are commonly used by scholars in this area? Do these scholars mean the same thing when they use the same concepts; i.e., do they connect the concepts in the same way? The second task is the identification of the ties among the scholars in this community. Ties among scholars are identified using citations. Are there pockets of isolated scholars? Are there scholars who appear to hold more

power (act as gatekeepers)? The third task is the comparison of the patterns among researchers formed by shared knowledge and interaction. Are the scholars who cite each other likely to say the same thing? Does the web of shared meaning reflect the web of interaction?

We begin our demonstration of literature analysis with a definition of consensus, structure, and the relationship between them. This section is followed by an empirical illustration. We apply the two methods (textual map analysis and network analysis) to texts in the organizational culture subfield. The results of our analysis provide some insight into the nature of the organizational culture subfield and how it has changed over time. Our focus, however, is more on the methods than the data. Thus, the analyses we present were chosen to illustrate the types of questions that could be addressed using this approach.

The field of organizational culture is ideal for purposes of illustration. It is a fairly large and growing field that has captured the imagination of researcher and practitioner, and for which there is debate as to whether or not consensus exists. Part of this debate stems from the hesitancy of many organizational scholars to consider culture a useful concept. The concept of organizational culture is criticized for lacking identifiable definitions of basic concepts, agreement on acceptable methodologies of inquiry, and criteria for determining important research questions for the field. Despite these criticisms, organizational culture has become an area of research for organizational scholars and an area of increasing importance for practitioners. Between 1986 and 1993 there were over 4,800 articles in the academic and popular press on organizational culture. Over the past twenty years there were over sixty articles in mainstream organizational behavior journals, alone, on this topic. Within related fields, such as sociology, the study of culture is one of the fastest growing subfields. The strong presence of organizational culture in the media suggests a belief in the usefulness of culture as a framework for studying behavior in organizational contexts, despite critical claims to the contrary.

Organizational culture, characterized by a high level of complexity, is a good subject area for demonstrating the literature analysis approach. With a tradition of controversy, we would expect to find pockets of consensus in an area that is generally known for its multiple paradigms. Such a dynamic subject area would benefit from an analysis that is able to summarize without creating new definitions, and even more conceptions of culture. Literature analysis makes it possible to identify consensus and measure its strength and relation to the social structure. The analysis we perform may enhance our understanding of the organizational culture subfield by identifying whether or not the pattern of consensus and structure resemble each other or are coming to resemble each other over time at least for the core work in this area.

2. The nature of consensus

Consensus can be characterized in terms of shared beliefs, knowledge, or mental models (Fauconnier, 1985; Carley, 1993, 1994a). Authors¹ when they write a paper

¹ We have use the term 'author' as shorthand for author or authors, recognizing that whether single or multiply authored, a text must have a single voice.

or book put forth part of their mental model on a subject (Kaufer and Carley, 1993). These mental models are seen in the concepts the authors use and the inter-connections they make among these concepts. New textual analysis techniques enable the coding of texts as mental models and thus make the measurement of consensus possible. There are many such techniques (e.g., for a comparison of techniques see Carley, 1997). We use a non-invasive automated technique referred to as map analysis in which the mental models is abstracted from a text and coded as a network of concepts (Carley, 1997; see also Carley and Palmquist, 1992; Carley, 1993, 1994b, for the non-automated version). This technique will be further described in the method section. For now, we note that if there is consensus among researchers it should be evident as a pattern of similarities in the mental models abstracted from the texts. Admittedly the analysis of texts overlooks much of the information that is actually shared among researchers. At best it is a sample of their shared mental models. But, it is the sample that is visible to researchers outside the subfield who are trying to gauge the level of consensus within that subfield.

3. The nature of structure

Structure refers to the pattern of interactions among the individuals in the community. One manner of determining the presence of social organization in a field is to focus on the pattern of formal interactions among scientists. A common measure of the pattern of formal interactions among scientists is the pattern of citations (Lenoir, 1979). Traditionally, this type of analysis was done by simply counting the frequency of citations. However as Lenoir (1979) points out, counting frequencies is inadequate, providing an incomplete picture of the structure of the research community in question. Lenoir explains that counting frequencies does illustrate who is heavily cited; but, it does not indicate any relationship among actors. Consequently, frequency of cites does not provide any information about the underlying social structure nor does it provide information about the influence of this structure on the level of consensus in the field. Instead, citation patterns form a network connecting researchers to each other. Social network techniques can be applied to analyzing such networks. The result goes beyond frequency counts to an empirical analysis of the patterns of interaction. If there is a link between shared mental models and interaction it should appear as a link between what authors write about and whom they cite. While analysis of citations overlooks much of the informal interaction among researchers, it indicates the underlying social structure and is visible to scientists outside the subfield who are trying to understand their own position in the subfield.

4. Relating consensus and structure

Lievrouw and her colleagues (1987) demonstrate the power of simultaneously examining what scientists write about and whom they interact with for providing an understanding of a field of scientific research. Their approach employs co-word

usage and co-citation. Following Lievrouw's lead, we examine the organizational culture discourse, by focusing on the extent to which researchers in this area write about culture in the same way. However, we extend the earlier approach by looking at shared meaning and direct citation. Map analytic techniques enable us to extract, code, and analyze the network of concepts within texts, i.e., the authors' mental models (Carley and Palmquist, 1992; Carley, 1993, 1994b). From these coded texts the network of shared knowledge among researchers can be constructed. Social network techniques enable us to extract, code, and analyze the network of relations among researchers, thus empirically locating social structure (Scott, 1991; Wasserman and Faust, 1994). The shared knowledge network and the citation/interaction network can then be contrasted at multiple points in time to determine the emergence of the scientific field.

5. Data

This study uses a snowball sampling procedure to locate the set of texts and authors in the organizational cultural area. A 'snowball' method of sampling is advantageous because it can provide a complete picture of activities in a problem area (Crane, 1969b). Snowball sampling provides information about the people who make few as well as many contributions to the field. There are three sources of data used in this study: set 1, abstracts and reference sections for culture articles that appeared in major organizational journals over a twenty-five year period; set 2, abstracts or introductory paragraphs and reference sections in articles and books considered important in the field; set 3, abstracts and reference sections in culture articles and books referenced by articles in either or both of the previous sets.

Set 1: All articles appearing in the journals *Academy of Management Journal* (AMJ), *Academy of Management Review* (AMR), *Administrative Science Quarterly* (ASQ), and *Research in Organizational Behavior* (ROB) during the period, 1968 to 1993, were examined. These journals represent four of the most prestigious journals in the organizations field. Research reported in these journals would be read by a large audience of researchers and would be most representative of the overall position of organizational culture in organizational science. Articles were taken from AMJ, AMR, and ASQ for the entire period of 1968 to 1993. Articles from all eleven volumes of ROB were used. For each journal, only those articles were selected which used the word 'culture' in their title. By focusing only on those articles that have culture in the title, important works on culture might be missed. This is one of the reasons that the articles and books in set two were collected. Set 1 resulted in 29 articles. The distribution of articles across these journals is 2 from AMJ, 11 from AMR, 13 from ASQ, and 3 from ROB.

Set 2: A set of articles and books on culture that are generally considered important to the area of organizational culture were collected. The importance of the text in the organizational culture field was ascertained by recommendations from faculty who had taught organizational culture in their courses and/or did research in this area. This resulted in an additional 46 articles and 56 books. Interestingly, the vast

majority of the publications suggested had culture in the title. This suggests that the use of that criteria was not overly limiting.

Set 3: A set of articles and books cited by articles or books in set 1 or 2 that have the word “culture” in their title. This resulted in 29 new articles and 36 new books. Many of the articles and books located in this fashion had already been located by one of the previous methods.

The overall data set has a total of 104 articles and 92 books. We decided to concentrate on the core literature. The articles that were most likely to be read. Consequently, we dropped from our analysis all articles and books from set 2 and 3 that were not cited by two or more other articles or books in this sample. Afterwards there remained a set of 46 articles and 24 books which can be thought of as the core literature in this area. Most of the publications dropped were not in the four main journals. The remaining publications span the time period from 1934 to 1993. In order to examine the change in the field of organizational culture over this span we divided these 70 publications into three time periods which we refer to as: the early years (pre 1974), the formative years (1974–1983), and the recent years (1984–1993). For each of these 70 publications we coded the discussion of culture in the abstract (or in the case of a book we coded the key paragraph in the introductory chapter that discussed culture) and the citations to other publications within this set of 70.

There are clearly limitations to this data set. Let us consider three of these. First, the set of texts is clearly not comprehensive. In particular peripheral actors and research on organizational culture outside of the organizational/management area will be excluded. If in fact authors that cite each other are more likely to share ideas, then the focus on the core articles should increase the likelihood of observing consensus. Second, by focusing on abstracts the texts being analyzed are quite small. Thus, our analysis may miss nuances of the way in which culture is portrayed in the literature. More importantly, since most abstracts focus on presenting what is novel in the article the focus on abstracts should decrease our likelihood of observing consensus. Thus, simply in terms of consensus, the impact of focusing on core texts and on abstracts should counter each other. Third, by focusing on citations important aspects of the social structure – such as student–mentor relationships – are neglected. Additional limitations and features of this data and the resulting analysis will be discussed further on in the paper. For now, we note that despite these limitations, this data set does meet our primary requirement; i.e., it allows us to simultaneously examine changes in knowledge and interaction ties over time. Moreover, the focus on core articles, abstracts, and citations centers our analysis on precisely those aspects of the field that new researchers and those outside the field are most likely to observe. Thus any trends observed should be the central trends in the field of organizational culture.

6. Method of analysis

6.1. *Measuring consensus*

Using map analytic techniques the researcher codes the mental model in the text as a network of concepts (Carley, 1988, 1993; Carley and Palmquist, 1992). This network shows how the author relates a set of concepts to each other. This network can be thought of as the author's definition of a particular focal concept. In our case, the focal concept is 'culture'. Within this network the 'concepts' are words or phrases each of which represents a single idea. These concepts can occur in the text verbatim or they can be a generalization of the words in the text.

We use a set of 254 concepts which capture the way these researchers talk about culture. In generating this list of concepts we had two primary concerns. First, we did not want to include words in our analysis that did not represent key concepts. Second, we did not want to over-estimate the importance of a concept due to repetition among synonyms. We formulated a set of coding rules to achieve these objectives. These rules are as follows. Delete words that are not key concepts; specifically, delete articles such as *a*, *an*, and *the*. Delete non-essential adjectives, adverbs, and prepositions. Recode words with the same base but different tenses into a single word; e.g., *look*, *looked*, *looking* would be re-coded as 'look'. Recode the plural and single form into the same word; e.g., *organizations* and *organization* would both be re-coded as 'organization'. Recode proper names into the noun that they represented; e.g., *Hewlett-Packard* and *Xerox* would be recoded as 'organization'. Recode synonyms into a single word; e.g., *theory*, *idea*, *knowledge* would be recoded as the general concept 'paradigm'. We created this list of synonyms using a thesaurus. Then, we double checked each possible recoding to make sure that the meaning of the word or phrase to be recoded had, in organizational culture context, the meaning implied by the word it was to be recoded as.² After applying these rules, the number of unique concepts remaining was 254.

These rules have the effect of ensuring that key words in simple phrases will appear as connected words. For example, consider the phrase *management by consensus*. If each word were coded, the linkage between 'management' and 'consensus' would be lost as would the overall sense of the phrase. By deleting the non-essential words and translating concepts, the text is focused down to key meanings (see Carley, 1997, for a discussion of limitations and advantages of this approach). An alternative would have been to recode phrases as a single concept. The difficulty with such an approach is that these phrases tend to be more in the nature of jargon. Thus inter-rater reliability in locating them can be low.

The set of texts that we coded were the abstracts in the articles and the key paragraph in the introduction of a book which defined its purpose. The recoding strategies just listed formed a set of rules that were then mechanically applied to the texts using a UNIX script program. Then for each processed text we automatically gener-

² The approach taken to create and evaluate the synonym list is essentially the same as the approach for manual concept validation given multiple random samples of relevant texts used by Fan (1988).

ated a map using a computer program which locates statements (two concepts and the link between them) for all pairs of concepts within a certain number of words of each other (see Carley and Palmquist, 1992, for details on a non-automated approach to coding mental models and Carley, 1997, for additional details on the automated approach). This process eliminated the possibility of human error in recoding concepts and generating maps. For this paper, we decided that each pair of concepts that appeared in a text formed a statement. We chose this strategy as the texts we analyze, abstracts and introductory paragraphs, are very short. Therefore, it is reasonable to expect that there is a semantic link between all concepts within the text. For control purposes we also coded a set of texts by hand, and we used more restrictive definitions of semantic linkage (such as only put a link among words within a certain distance of each other). Results from these controls were qualitatively similar to those we report. Our coding approach appears to have reduced coder error and not to have altered the specific findings.

To illustrate this coding technique, two texts, their concepts, and empirical descriptive information are provided in Fig. 1. These are both hypothetical abstracts and not part of our data set. Each author's text is coded as a network of interconnected concepts. The ties in this case are between concepts and not scholars. These networks of concepts, or maps, convey the meaning in the text. In deleting non-key concepts we did not delete words indicating a positive or negative influence; i.e., words such as *non*, *not* are coded.³ Thus, authors which use similar words except for negative expressions actually are less similar to those using the same words but in a positive fashion.

The networks extracted from texts can be analyzed in terms of what nodes/concepts are present or in terms of what links/statements are present. To interpret the analysis shown in Fig. 1, and later analyses, a few definitions are needed. To begin with, when the number of concepts or statements are listed this is the number of different concepts or statements. If a concept or statement occurs multiple times it is counted only once. The elaboration index is the number of statements per concept. 'Distinct concepts/statements' refers to the number of different concepts/statements for the entire time period. This discounts for concepts/statements that are used in more than one text during that period. 'Unique concepts/statements' refers to the set of concepts/statements which occur in only a single map (or in only a single time period).

The validity of this type of analysis rests on several factors, two critical ones being the level of inter-rater reliability and the 'accuracy' of the generalizations used. The approach we have used totally eliminates issues of inter-rater reliability. The question remains how good are the generalizations we have made? Or, to state this another way, would the results differ if we had used a different level of generalization. To address this issue, we coded these texts with less generalizations (this

³ A secondary analysis was also done in which we examined the impact of negation. First, all key concepts were coded using positive words and 'non'. Thus *unlikely* became not likely. After these changes all texts were coded. Second all key concepts were coded leaving the concepts unchanged. This recoding did not appreciably affect the results.

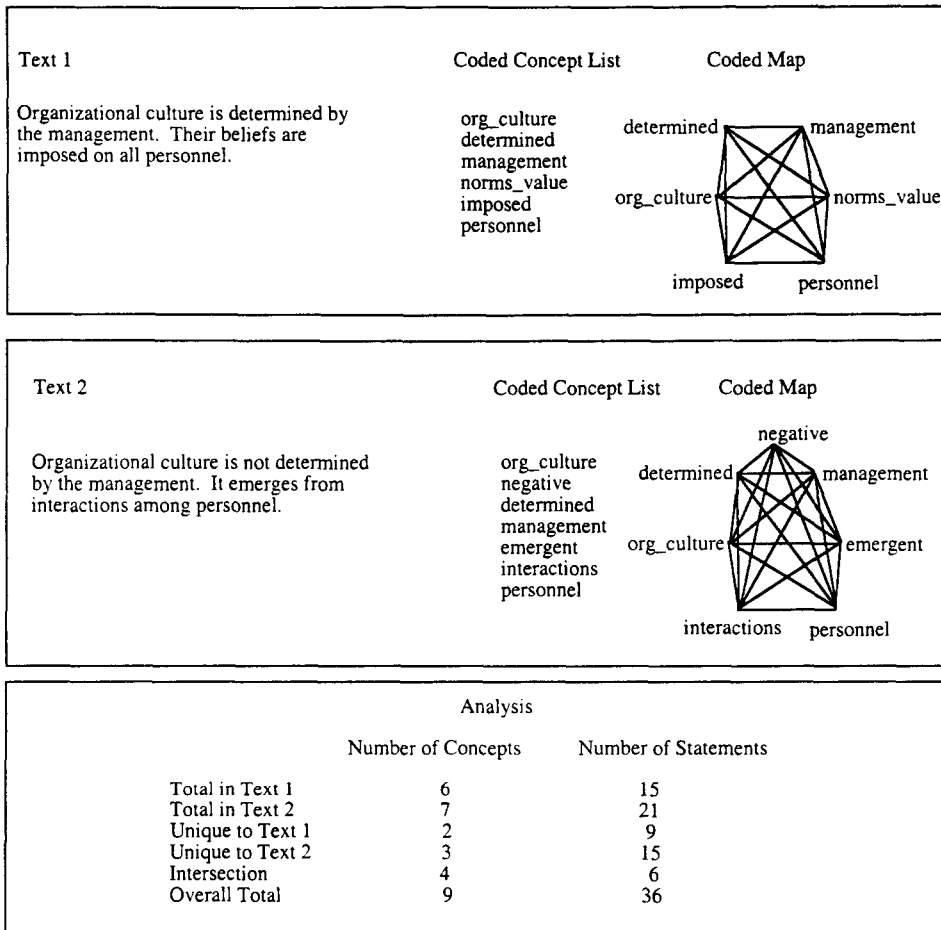


Fig. 1. Illustrative texts and analysis.

results in a larger set of concepts) and with more. We found that within a fairly wide range of generalization (twice as many total concepts to 3/4's as many concepts) the same basic results we report appear. By this we mean that the types of changes we see over time and across sub-groups are comparable. We also coded the texts by hand, and found that the discrepancies introduced by human error altered the findings more than the level of generalization did. And, of course, when manual coding is used issues of inter-rater reliability arise (here, with only minimal training, we were able to achieve a rating of 0.78 for concepts and 0.70 for statements). Finally, given the coded texts we can construct a shared knowledge network where the strength of each tie is the number of concepts/statements appearing in both texts.

6.2. *Identifying social structure*

Using social network techniques the researcher codes from citations the structure of a community as a network of authors. This citation network shows the relationship among authors. This network can be analyzed in terms of what nodes/authors are present or in terms of what links are present. Graphically, a node with high 'out-degree' has many arrows leaving it, indicating that author cited many others (Scott, 1991; Wasserman and Faust, 1994). Graphically, a node with high 'in-degree' is the object of many other arrows, and therefore denotes a highly influential author. The betweenness centrality measure is an overall measure of position that takes into account both who cites and who is cited. Betweenness has been characterized as an indicator of the power of a node. In the context of a citation network, an author with high betweenness centrality would be one of the field's knowledge gatekeepers. Such authors introduce new information into the field by reading other authors and incorporating the ideas with their own in a paper which is then read by other scholars in the network. Members of the research community are introduced to each other's ideas through the work of these gatekeeping authors. For each text we coded the citations from that text to the other texts in our sample. We treat each text as a unique node so as to facilitate the comparison between the maps and the network. As most researchers appear only once in the data set this has little impact on the resultant analysis.

7. Results

The preoccupation among practitioners and managers indicates practitioner consensus regarding the importance of culture and the advantages to be gained by manipulating it for economic control (Barley et al., 1988). However, the extent to which consensus occurs among organizational scholars is debatable. Is there a lack of consensus among researchers over the meaning of organizational culture? How does the pattern of interactions among scientists in this area influence the existence and nature of this consensus (or its absence)?

7.1. *General overview*

Of the 70 texts in our sample 41% appear in the four main journals, 25% in other journals, and 34% published as books. This breakdown indicates the importance of books as a communication device for this group of scholars. Interest in the subfield of organizational culture has grown (see Fig. 2). The majority of articles were published between 1968 and 1993 in the four journals, were actually published during the formative years. That is, 17 articles were published in these journals between the years 1974–1983. Interest in organizational culture in mainstream organizational behavior, as evidenced by publication in these major journals, started in the early eighties. Publication of texts on culture peaked late in 1983 with ASQ's special issue on organizational culture. This issue marks the beginning of a long process of scientific development from a fledgling field into a more established one.

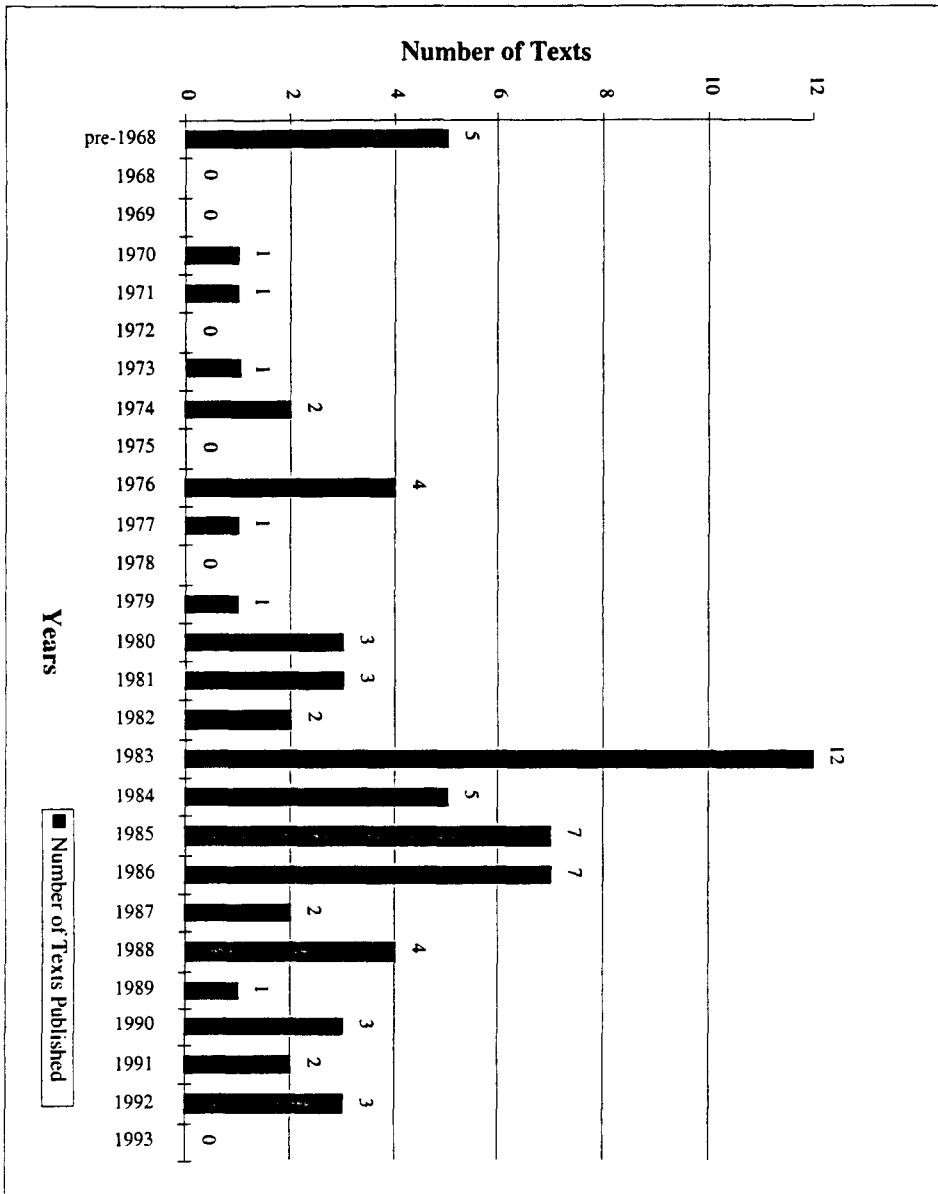


Fig. 2. Number of texts per year.

Over time, general features of the field have changed (see Table 1). There has been an increase in activity in this field: the number of authors and texts has increased. We also find that the breadth of the discussion about culture has grown (witness the growing number of distinct concepts and statements), and individual

scholar's mental models of culture have become more elaborate (more statements per text). Now let us consider how the consensus and structure of the subfield of organizational culture has changed over time.

Table 1
Historical trends in organizational culture

	Early years pre 1974	Formative years 1974–1983	Recent years 1984–1993
Number of texts	8	28	34
Number of unique authors	9	38	45
Average number of citations to this text in our sample	6.5	6.8	1.9
Average number of concepts per text	26.6	32.3	32.1
Average number of statements per text	369.0	559.0	541.4
Average elaboration index per text	13.9	17.3	16.9
Total number of distinct concepts in this time period	103	904	1091
Average number of distinct concepts in this time period per text	12.9	32.3	32.1
Total number of distinct statements in this time period across texts	2345	8331	8426
Average number of distinct statements in this time period per text	293.1	297.5	247.8

7.2. *Consensus in the organizational culture subfield*

Our results indicate that there is a growing general consensus; however, this consensus is somewhat superficial and is often hidden behind the rapid growth of findings in this area. The fact that a smaller fraction of the concepts/statements in a text are distinct in the latter years than in the early years suggests that there is a growing consensus. Further, the number of concepts/statements used in both the formative and recent years is higher than the number of concepts/statements shared with the early years (see Table 2). That is, there is a development of common knowledge.

The rapid growth of new ideas masks this consensus. In the early years 1.41% of the statements (33 statements) are shared by 50% or more of the writers. The percentage and number of shared statements drops to 0.17% (14 statements) during the formative years, and then rises to 0.26% (22 statements) in recent years. These percentages are misleading as the actual number of researchers in this area has rapidly increased. Thus, the number of people who concur to anyone statement is actually much higher in later years. Over time, the number of concepts per text has increased which might indicate a decrease in focus (see Table 1). However, the number of concepts/statements that are unique to that time period (total and per text) has also increased which indicates idea generation (see Table 2). Specifically, the number of concepts/statements that are unique to one period has actually grown over time. These two opposing forces – accumulation and knowledge generation – when taken together mask the underlying growing consensus.

There are several ways of interpreting this finding. First, the increase in unique concepts might suggest that cultural researchers are increasingly linking culture to new phenomena. Alternatively, this increase might suggest that the field is not cumulative and researchers are not linking to earlier conceptions of culture. However, these two explanations cannot completely explain the fact that the number of concepts linked to culture that are distinct to each time period increases from the early years to the formative years and then holds constant. Nor can these explanations totally account for the greater similarity in what is said about culture during the recent and formative years.

We extracted all of the statements in all of the maps with the word 'culture' in them. There were only two concepts (and three statements) that were linked to culture in early years but not in later years. Whereas, in the formative years there were 36 unique statements including culture, and in recent years there were 37 such statements. In all cases, most of these statements involve concepts used only in that time period. Indeed, that researchers are using more concepts/statements that are unique to that time period might suggest an increasing timeliness, currency, or claim of novelty, in the way researchers are describing their work. This would be consistent with the argument that journals are increasingly looking for novelty.

Table 2
Consensus over time

	Concepts		Statements	
	Total	Per publication	Total	Per publication
Unique early years	12	1.71	118	16.86
Unique formative years	71	2.54	530	18.93
Unique recent years	85	2.43	676	19.31
Both early and formative*	58		33	
Both early and recent	67		38	
Both formative and recent	138		131	
Occurs in all three periods	52		23	

The question then, is whether an institutional pressure for novelty, particularly in one's abstract, is masking consensus. To further examine this, we looked at the content of the maps to see what it was that was being consented to over time. Over time, what it is that scholars are agreeing to has changed. These trends can be seen by examining the maps containing those concepts used in 50% or more of the texts during each period (Fig. 3a through 3c), and the set of most frequently used concepts (Table 3).⁴ In the early years the concept of culture was imported from other

⁴ A low fraction of agreement is reasonable as: (1) abstracts represent only a small portion of what the authors state in the paper, (2) texts themselves are only a sample of what the authors know; (3) priority and novelty claims must be done to get texts published. These three factors work against the presence of consensus across abstracts, consequently, even a low level of agreement should be an indication of shared mental models.

branches of the social sciences – notably anthropology. The texts written in the early period have a common purpose. The primary focus of these texts is to accurately capture the culture concept and to identify the proper way that culture should be observed. As an illustration, two texts – Benedict's (1934) book *Patterns of Culture*, and Kroeber and Kluckhohn's (1952) *Culture A critical review of concepts and definitions* – were heavily cited by texts in later periods (the next section provides a detailed discussion of citation patterns). Benedict's book *Patterns of Culture* was written in a time of transition for American anthropology from a focus on the history of human culture derived from archaeological artifacts and manuscripts to concentration on the development of living cultures, collecting field data in the context of the social group studied. The concern with the transition is expressed in the following excerpt from the introduction of the book.

"In this present volume the author has set before this problem and has illustrated it by the example of three cultures that are permeated each by one dominating idea. This treatment is distinct from the so-called functional approach to social phenomena in so far as it is concerned rather with the discovery of fundamental attitudes than with the functional relations of every cultural item. It is not historical except in so far as the general configuration, as long as it lasts, limits the directions of change that remain subject to it." (Benedict, 1934: xiii)

Kroeber and Kluckhohn's (1952) piece attempted to establish the importance of the culture concept in social sciences.

"The 'culture concept' of the anthropologists and sociologists is coming to be regarded as the foundation stone of the social sciences. This recent statement by Stuart Chase will not be agreed to at least not without reservation by all social scientists, but few intellectuals will challenge the statement that the ideal of culture, in the technical anthropological sense is one of the key notions of contemporary American thought. In explanatory importance and in generality of application it is comparable to such categories as gravity in physics, disease in medicine, evolution in biology." (1952: 1)

These two pieces demonstrate the primary concern of defining the concept and establishing the importance of the culture concept in social sciences during this period. When considering this in the context of our study, each of these pieces provides the intellectual foundation for the introduction of the culture paradigm in organizational theory. Analysis of all of the texts during this period shows that consensus was largely over the idea that culture was an important phenomena to study. It is reasonable to infer that organizational theorists who would later cite this work were interested in how earlier discussions of culture in anthropology could contribute to organization theory. (Should we delete the following sentence?) Methodologically, the authors of this period focused on demonstrations and assertions to make their points.

During the formative years, the culture concept was integrated into the organizational literature and organizational culture emerged as a subfield in organizational theory. This event can be inferred by the nature of the texts coded during this period. Texts written during the formative years were primarily concerned with defining culture in the context of organizations. Consequently influential texts of the period, such as Pettigrew's (1979) study of the development of culture in a boarding school,

or Deal and Kennedy's (1982) book on development and management of culture in the corporation attempted to demonstrate the applicability of the culture concept for organizational theory. Thus the desire to use the culture concept in organizational studies resulted in a focus to legitimize the culture concept by demonstrating that culture could be descriptively classified and systematically observed. Subsequently, analyses of texts during the formative period indicate cultural researchers concurred that culture was an important element within the more general organizational paradigm. Analyses also indicate that researchers exhibited technical agreement by concurring that to study culture was to investigate its impact on some phenomena; however, each author typically distinguished his or her research by elaborating further on the specific phenomena of interest. Through intellectually locating culture as part of the overall organizational paradigm these researchers were integrating culture into mainstream theory and they were doing so by making culture an explanatory variable and defining it in terms of norms and values. In recent years, there has been a subtle shift in the organizational culture discourse. Organizational culture discourse has shifted its concern from phenomenological explanations to empirical models. Organizational culture literature during this period focused on identifying components of culture that could be manipulated to effectively impact outcomes such as effectiveness, performance, and turnover (Wiener, 1988; Saffold, 1988; Sheridan, 1992). Furthermore, a meta-analysis of culture literature conducted in this period by Barley et al., (1988) concludes that organizational culture research can be characterized by a preoccupation for effectively manipulating culture in organizations to realize economic goals. Subsequently analyses of texts in this area indicate that researchers continue to describe culture (defined as norms and values) as its own paradigm, distinct from the 'mainstream' organizational paradigm, and attended by its own methods and analysis techniques. However, unlike the early years, the current focus is on culture within organizations and culture as explaining the uniqueness of particular organizations. Motivated by a desire to manipulate culture to realize economic goals, researchers concur over the importance of simultaneously studying the organization (its structure and design) and its culture. Just by examining the consensus in these texts we see that over time, organizational theorists took the idea of culture from anthropology, claimed it as their own, and then proceeded to adjust the concept for their own purposes.

Throughout time there are similarities in what is said about culture. There are 230 statements that are made in two or more texts in each period. Substantively, over time there has been a continuing interest in cultural differences, the impact of culture on the individual, and the interplay between culture and organizational rules. Methodologically, there has been a continuing emphasis on studying culture through illustrations. This attests to the continuing importance of qualitative techniques in this subfield.

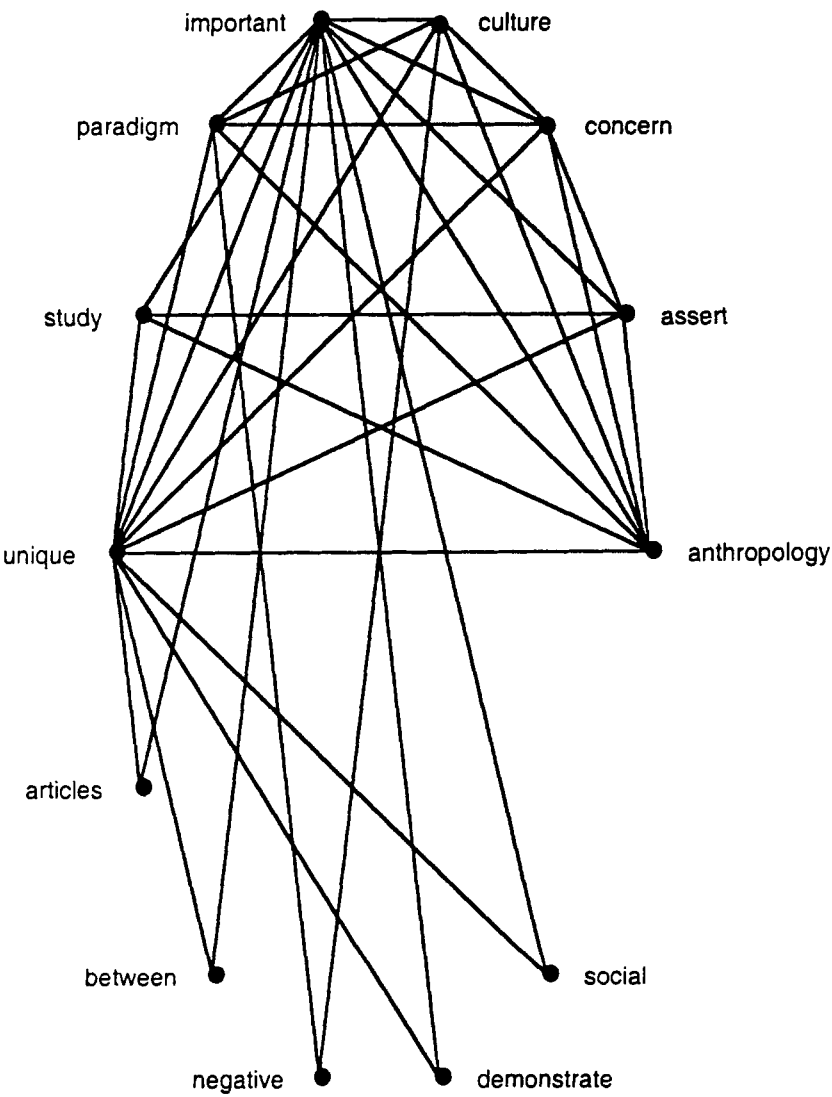


Fig. 3a. Early years: Statements used in at least 50% of texts.

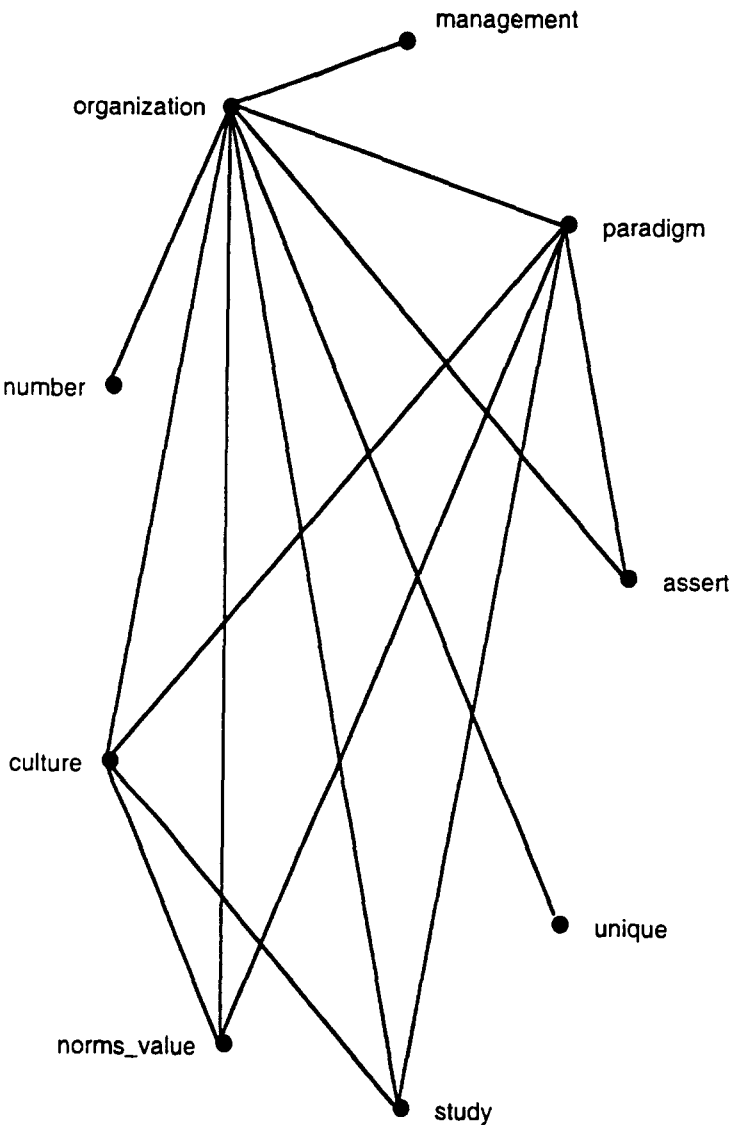


Fig. 3b. Formative years: Statements used in at least 50% of texts.

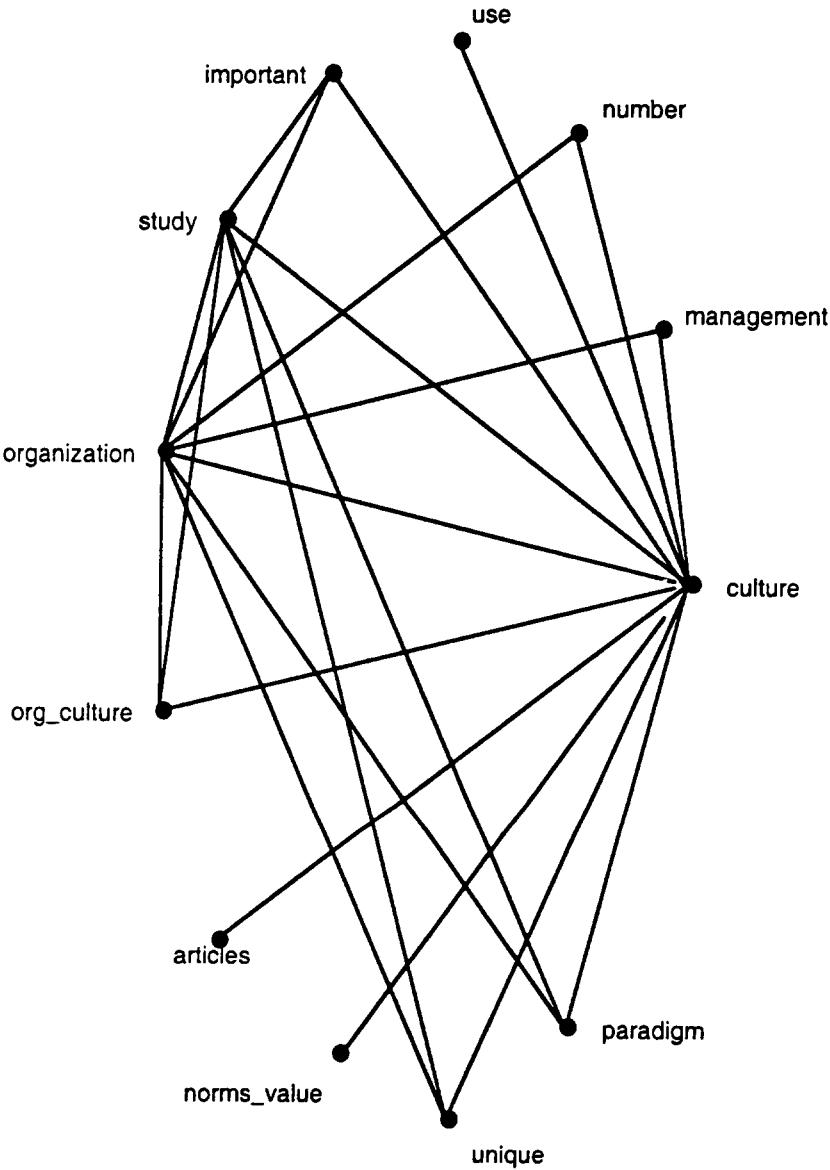


Fig. 3c. Recent years: Statements used in at least 50% of the texts.

Table 3
Concepts used in 50% or more of the texts by time period

Early years	Formative years	Recent years
articles (4)		
between (4)		
demonstrate (4)		
negative (4)		number (17)
number (4)		use (18)
science (4)		articles (19)
social (4)	number (14)	norms_value (20)
anthropology (5)	management (14)	org_culture (20)
assert (5)	assert (16)	important (21)
concern (5)	study (17)	management (21)
study (5)	unique (17)	paradigm (24)
culture (6)	norms_value (18)	unique (24)
paradigm (6)	culture (23)	study (26)
important (7)	paradigm (24)	organization (28)
unique (7)	organization (26)	culture (30)

Note: The number in parentheses is the number of texts during that period in which that concept occurred.

8. Structure of the organizational culture field

8.1. Centrality

There are several ways that a researcher can potentially influence the generation of knowledge in their research community. Traditionally, citation frequency indicates influence within a scientific community (Lievrouw et al., 1987). The most cited text is often interpreted as an indicator of the relative influence of a particular idea. Citation level is often asserted to be an indication of leadership or importance in a field. However, citation frequency is an incomplete measure of influence among a community of researchers as it only tells us who is heavily cited, but doesn't provide any information about the nature of the relationship among actors and their influence in the cognitive structure of the research area (Lenoir, 1979). A researcher can also be influential in their capacity as gatekeepers. A researcher whose work is well read can direct attention to the work of other researchers that is not as well known. Influential researchers not only influence knowledge in the field by their ideas, but also establish connections among other researchers by citing the work of other, less prominent researchers. In a sense, researchers that are heavily cited *and also* cite many others act as a bridge connecting members of their research community to each other. Therefore, it is helpful to examine not only the texts that are heavily cited, but texts that cite many others and texts that are cited heavily *and* cite many other texts. Subsequently, this analysis examines three different types of centrality, in-degree, out-degree, and betweenness.

In-degree centrality is the traditional measure of influence, which would identify texts that are most frequently cited. Betweenness centrality would identify those texts that are both heavily cited and cite many others. This measure identifies texts that serve as bridges connecting members of the research community by familiarizing them with each other's work. Finally, out-degree centrality identifies those texts that cite many others. Researchers may not necessarily cite these texts at all. Research that cites heavily but is not heavily cited may identify texts written by researchers that are newer to the research area, or literature reviews. In any event texts that cited many other articles were also identified.

Measuring the betweenness of a text within a citation network provides insight into its overall role in the structure of the subfield. In Table 4 the texts with the highest centrality, for each of these three indicators are listed. The most cited texts are Geertz (1973), Pettigrew (1979), and Deal and Kennedy (1982), each of which is cited more than 14 times within this sample.⁵ The works of Deal and Kennedy (1982), Schein (1983), and Barley (1983) have the highest betweenness, and in that sense their work defines this subfield. Of the texts which cite the most (out-degree) only Ouichi and Wilkins (1985) is a review.

There are, of course, boundary effects on the foregoing analysis. That is, texts in earlier time periods have a greater probability of being more heavily cited than do texts in later time periods. Similarly, texts in earlier time periods have a lower probability of citing other texts than do texts in later time periods. And texts in the formative years have the highest probability of having a high betweenness score. Consequently, the high level of citation seen in Ouichi and Wilkins (1985), Barley (1983), and Smircich (1983) is important as it is distinctive for the time period (formative years). While it is not surprising to see Benedict (1934) highly cited given that it was published in the early period, it is surprising to see the high level of citation to Schwartz and Davis (1981), Van Maanen and Barley (1984), Schein (1990), Trice and Beyer (1984), and Wilkins and Ouichi (1983) all of whom were published during recent years.

As noted, the texts in the formative years are more likely to exhibit high betweenness scores. Interestingly, five of the 13 texts with the highest betweenness occurred during the current period not the formative years. The high betweenness of Allaire and Firsirotu (1984), Schein (1990), Trice and Beyer (1984), Barley et al. (1988), and Hofstede and Neujin (1990) is unexpectedly high for their time period. Texts with high betweenness contribute to building the subfield through communicating the ideas of researchers who are not as heavily read, to the general community of researchers in the subfield. These high betweenness texts act as information gate-

⁵ The most cited articles and the most cited authors are not necessarily the same. Frequently cited articles are often reviews or seminal articles. Frequently cited authors are often prolific writers. Herein we focus on articles and not authors. Since, so few authors in our sample have authored multiple texts the correlation between frequently cited authors and frequently cited texts is higher than it might be in other cases. For our sample, the five most cited authors are Deal and Kennedy (23), Barley (22), Pettigrew (21), Geertz (18) and Schwartz and Davis (16). Other than Barley, these authors are receiving all of their cites for a single article. And, even in the case of Barley, one of his article is among the top ten most cited articles (see Table 4).

Table 4
Authors with the highest centrality in the interaction structure

Out-degree (normalized)	In-degree (normalized)	Betweenness centrality
Ouchi and Wilkins, 1985 (30.43)	Deal and Kennedy, 1982 (33.33)	Deal and Kennedy, 1982 (2.28)
Schein, 1990 (28.99)	Pettigrew, 1979 (30.43)	Schein, 1990 (2.14)
Enz, 1986 (24.64)	Geertz, 1973 (26.09)	Barley, 1983 (1.59)
O'Reilly et al., 1991 (23.19)	Schwartz and Davis, 1981 (23.19)	Louis, 1983 (1.18)
Gordon, 1991 (21.74)	Smircich, 1983 (18.84)	Allaire and Firsirotu, 1984 (0.99)
Saffold, 1988 (21.74)	Van Maanen and Barley, 1984 (14.49)	Smircich, 1983 (0.92)
Barley et al., 1988 (20.29)	Barley, 1983 (14.49)	Pettigrew, 1979 (0.73)
Allaire and Firsirotu, 1984 (18.84)	Gregory, 1983 (13.04)	Hofstede and Neujin, 1990 (0.56)
Rousseau, 1990 (17.39)	Schein, 1990 (13.04)	Fine, 1984 (0.47)
Sackmann, 1992 (17.39)	Martin and Siehl, 1983 (13.04)	Barley et al., 1988 (0.46)
Lucas 1987 (13.04)	Louis, 1983 (13.04)	K. Gregory, 1983 (0.46)
Wiener 1988 (13.04)	Hofstede, 1980 (13.04)	Trice and Beyer, 1984 (0.45)
Fine 1984 (11.59)	Benedict, 1934 (11.59)	Ouchi and Wilkins, 1985 (0.45)
Barley, 1983 (11.59)	Baker, 1980 (11.59)	
Sheridan, 1992 (11.59)	Trice and Beyer, 1984 (10.14)	
Smircich, 1983 (11.59)	Wilkins and Ouchi, 1983 (10.14)	
	Silverzweig and Allen, 1976 (10.14)	
	Kroeber and Kluckhohn, 1952 (10.14)	
	Goodenough, 1971 (10.14)	

Note: The number in parentheses is the level of centrality for that text. Each of these papers are listed in the reference list.

ways exposing researchers to the ideas of researchers who occupy peripheral positions in the field (e.g. newcomers or scientists in other disciplines).

Let us consider the centrality of the texts when only ties within the time period are considered. During the early years there are 7 citations in time one to other people in time one. The most cited texts among authors in that time period are: Benedict (1934) with 4 citations, and White (1949) with 2 citations. There are 34 citations among authors during the formative years: Deal and Kennedy (1982) 6 cites, Pettigrew (1979) 9 cites, and Schwartz and Davis (1981) 5 cites, are the most heavily cited by authors in this time period. Importantly, these same three texts are the most heavily cited across all time periods. There are 64 citations among authors in the most recent period. Van Maanen and Barley (1984) 6 cites, Trice and Beyer (1984) 7 cites, Schein (1990) 9 cites, are the most heavily cited among texts within this recent time period. These particular texts are influential in building the field during the period within which they were published. Notice, that for the most part, texts that are influential in latter periods are influential initially.

9. Relating consensus and structure in the organizational culture subfield

Is it really the case that these influential texts provided the theoretical foundation for research that followed? Or, in other words, are articles that cite each other more likely to share statements than are those that do not cite each other? Evidence of the linkage between structure and consensus would be a sign that there is a community of scholars carrying on a discourse. Similarity of textual maps among authors who cite each other would demonstrate the influence of social structure. The data for each time period was categorized in a two by two factorial fashion: *cited/did not cite by shared statements/did not share statements*. One tailed t-tests on the difference in proportions were used to examine whether those texts that cited each other were more likely to share more than the average number of concepts/statements than were those that did not cite each other showed some evidence for the development of a scholarly community.

Table 5
Citation and statement agreement over time

Time period	Sharing not cited	Sharing cited	T-statistic	One-tailed
Early years	0.29	0.00	-3.78	NS
Formative years	0.44	0.41	0.34	NS
Recent years	0.43	0.54	2.24	0.025
Overall	0.42	0.51	2.17	0.025

The results (see Table 5) indicate that overall authors that cite each other are significantly (at the .025 level) more likely to say more similar things. When looked at period by period, we find that only in the recent time period are authors that cite other authors writing in the same time period significantly more likely to be saying similar things. In the early years, authors who cited each other showed less consensus than those who did not cite each other. These results suggest that until recently, most individuals writing within a period are more or less competing with each other for claims to novelty and so rarely say the same thing. However, over time, a community of scholars that are aware of each other and tend to define things in the same way and to examine similar issues appears to be building in the area of organizational culture.

As an illustration of the relation between consensus and structure, we explored the consensus and structure around Barley's (1983) article. Consistent with texts in the formative period, this article proposed a method to systematically observe culture. In this article, Barley demonstrated how semiotics, the study of signs or systems of signs, could be used to understand how individuals ascribe meaning to their work lives. Barley illustrated this approach in an ethnographic study of a funeral home. We chose this article because, as noted earlier, its level of betweenness is unusually high given its period of publication. The consensus structure around such an influential actor should be indicative of the way in which the content of the consensus

structure in the field has evolved. In Fig. 4 the actor centered consensus structure and its relation to the actor's social structure is shown.⁶ Three sets of articles were considered: 'cites' (the 10 articles that cite Barley's 1983 article), 'cited by' (the eight texts cited by Barley in the 1983 article), and 'no-cites' (the three texts which share the highest number of statements and concepts with the Barley 1983 article and neither cite nor are cited by Barley). Concepts are listed in this figure only if they were used by Barley and fell into one or more of these three cases: 'was used by all three of the no-cites texts', 'was used by 4 or more of the cites texts', or 'was used by 4 or more of the cited by texts'. Those concepts in the middle circle all were used by Barley and occurred in the majority of the no-cites, cites, and cited by texts. In other words, most authors in this sample, whether or not they cited Barley, mentioned that they were in a paradigm where they were studying organizations and culture defined in terms of norms and values and were looking at management. The articles cited by and citing Barley share more of the same concepts/statements with Barley and each other than do those which neither cite nor are cited by Barley. Those who didn't cite nor were cited by Barley focused also on employees. Whereas, both those who cite or are cited by Barley also assert the importance of culture and focus on the role of meaning. Conceptual movement in the field is seen by those Barley cites talking in terms of processes and symbols, while those who in turn cite Barley focus on issues of creation, and use the culture paradigm to examine the specific phenomena of organizational culture. From an identity perspective, one might say that Barley's identity is being transformed from a processual theorist concerned with symbols to an organizational culture theorist concerned with the creation of culture.

10. Toward a better understanding of the development of scientific knowledge

We have presented a technique for examining the consensus and structure of a subfield which we term literature analysis. The results from the specific study described in this paper must be viewed with caution. To begin with, we measured consensus purely on the basis of the text's abstracts. Abstracts rarely give definitions but instead focus on what was done and what was found. On the one hand, by looking only at abstracts' concepts and statements that focus on the mechanics of doing and presenting research were perhaps overestimated. Concepts associated with the mechanics of research such as 'discover', 'find', 'present', 'analyze' did in fact appear frequently and were in most maps. Indeed, many of the abstracts devote space to describing methodology. This is demonstrated by the linkages between words like *propose*, *paradigm*, *study*, *investigate*, *develop*, *method*, *implication*, etc. To be sure, these mechanical terms are an important indicator of consensus about

⁶ The actor centered social structure differs from the more common ego network in that ties among those actors to whom the actor is directly linked are not shown and some actors that the actor is not linked to are shown. We did not look at other ties in the ego net as the density of the ego's network was not being examined. We put in non-connected actors for the sake of illustration to show the difference with those directly tied to ego (in this case Barley).

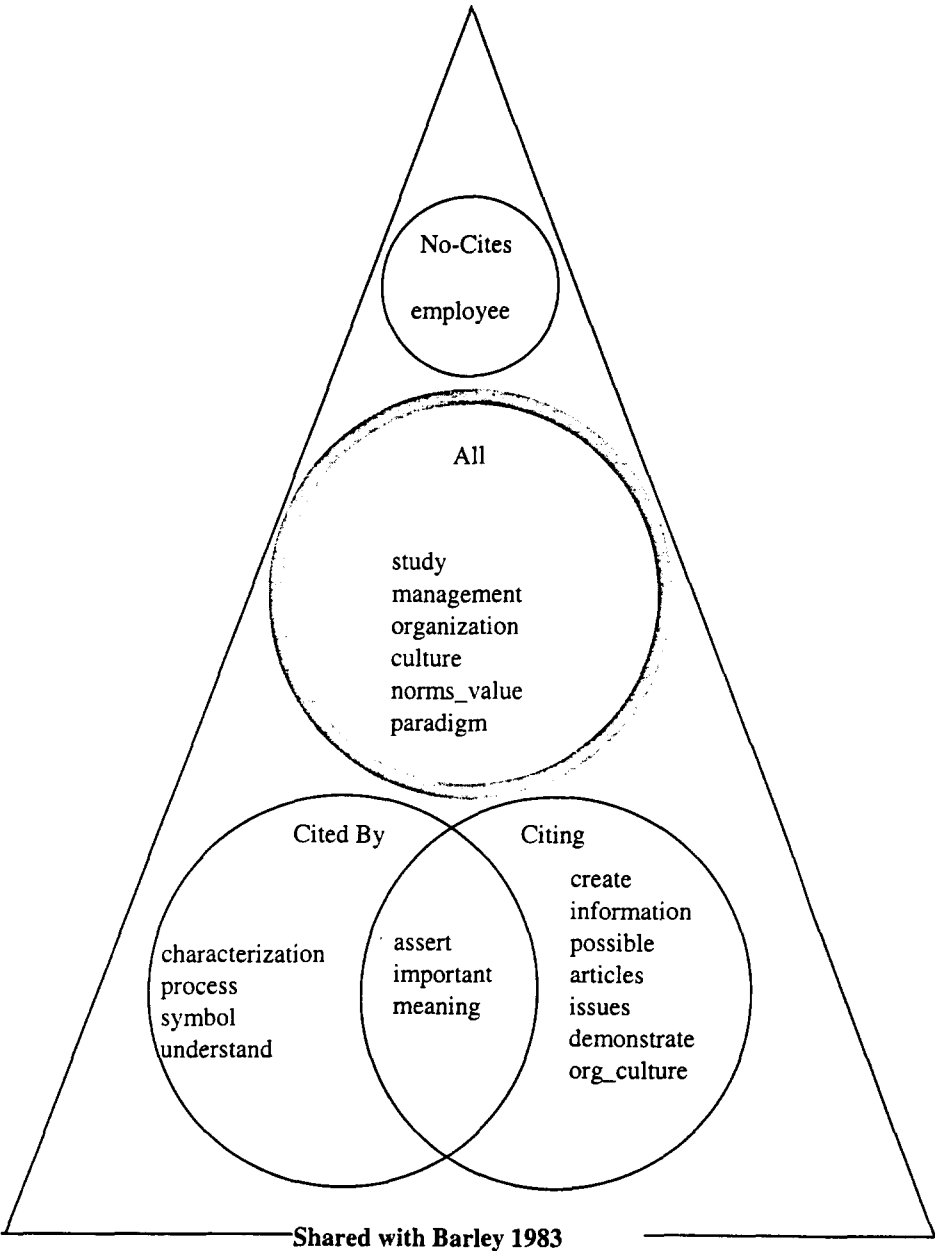


Fig. 4. Concepts shared with Barley (1983).

how to do research and they suggest that the style of doing research does change over time; i.e., over time the body of texts move from descriptive to analytical, from reporting to studying, and so on. Nevertheless, it might be worthwhile for a future analysis to focus on each author's definition of organizational culture. This would provide additional insight as to the conceptualization of organizational culture. Abstracts also serve a second purpose and that is to lay claim to novelty and to position the text in an ongoing discourse. We found, in a sense, many novelty claims; i.e., there were many unique concepts and statements in each text. We also found some positioning in on-going discourse in the form of shared concepts/statements that were not about the mechanics of research. We actually re-analyzed the data leaving out the most frequently used mechanical terms and the results were substantively the same as were presented; i.e., the level of shared concepts/statements was lower but the pattern of sharing was the same with or without mechanical terms.

Another caution has to do with the texts themselves. The sample of texts is small. It seems overall, that the number of organizational culture articles that have traditionally appeared in the journals we examined is quite small compared to the volumes of literature on the subject. Using the business periodical data base 'ABI Inform' the key words *corporate culture* were used to search for organizational culture literature. Between the years 1986 to the present day there are over 4800 articles published about organizational culture in business periodicals, both academic and popular. Popular business literature, books and journals in related disciplines such as sociology appear to have been more receptive to work in the organizational culture area.

Thus the 70 texts about culture that appear in the mainstream journals that we sampled represent a very small fraction of the 4800+ articles on organizational culture that have been published over the twenty-five year period of the sample. We chose texts primarily from generalist journals in the organizational area. Thus author's whose main treatise on culture appears in a book or in special purpose journals will not appear in this sample no matter how influential. Further, the texts we used were all cited by other texts that were obviously looking at culture and were in our sample. Additionally, texts selected for this review had to have *culture* in the title. This selection criterion is imperfect as there are texts about culture that don't necessarily have *culture* in the title. Organizational cultural researchers do not appear to frequently publish in the mainstream organizational behavior and organizational theory area. These journals may not represent the main channels through which knowledge on organizational culture is diffused to the organizational culture area. Expanding the analysis to include more books and alternative specialist journals would give a more complete picture of the subfield. Thus, it is possible that in our study, key researchers in the culture area might not have been included or their impact on the organizational culture field may be underestimated. We did take precautions against this happening by culling a list of articles from informants in this subfield. All authors they suggested appeared in our database.

Furthermore, we did a forward citation analysis on two articles in the sample to examine the inclusiveness of our sample. Choosing two articles identified as highly central in our analysis, Pettigrew (1979) and Smircich (1983), we recorded texts cit-

ing these articles until 1993, the last year of our sample. Between the two articles there were 147 cites. Of these citations, 13 are present in our sample. 48 of the citations are from journals unrelated to organization science. The remaining 86 articles while in journals in the field, are often in specialty journals and many use culture just in passing rather than focusing on it.

Our sample does not represent all of the discourse in the organizational culture field. However, this sample does reflect the influential articles on culture published in mainstream journals. One can interpret this sample as the tip of the iceberg, the part of the organizational culture field that is most likely to be observed by outsiders. Moreover, this sample is sufficient for illustrating the potential contribution of the proposed methods.

The degree of consensus that we observed is a function of the way in which we coded the texts. This was, for the most part, previously discussed. Here we want to speak to a few additional issues. There is always a chance in this type of automated analysis that words that can take on multiple meanings will be misclassified. We tried to avoid this by culling out words that had the potential for this problem, examining how they were used in each text and then if they were used in different ways in different texts recoding the phrase surrounding the concept not just the concept itself. Though tedious this did reduce the multiple meaning problem. A second problem is with the number of words that were used. In some sense, the likelihood of observed consensus increases as the number of concepts decreases. We chose a reasonable level of concepts: 254. Previous studies have indicated that specialized languages, the concepts needed for a specialized topic, often have on the order of 200 to 400 concepts. So we are within this range. Further, we did examine the texts both with more and fewer concepts and found qualitatively similar results.

We measured structure based upon a citation analysis. Clearly this does not capture all the nuances and types of interaction expected of a thriving community of scholars. However, it does focus on the structure of the community as observable by a non-member. Applying social network analysis techniques to citations does pose some interesting problems. In general, these techniques are used on networks of individuals who are more or less interacting at one time. In our case, we have historical root structure in which the linkages are over time. Thus, the typical interpretations of many network measures are not appropriate; however, we did suggest the appropriate interpretation for the centrality measures given citation data. Ideally, one would use temporal network techniques that discounted for start and end dates and had an appropriate weighting scheme. Such techniques, however, need to be developed and tested. Special problems arise for these schemes when citation data is used as journals have different levels of delay in publication and this affects the relative length of the tie between the citer and the cited. In this study, we adjusted for these boundary conditions by looking at the three time periods separately and searching for interaction patterns that were outside the norm for that period. This adjustment, though coarse grained, is appropriate as few journals have a delay of more than a few years.

Although there are some weaknesses to literature analysis such as we have done, there are some definite strengths. Such an analysis is more objective than the more

traditional literature review which depends entirely on the author's interpretation of the literature. The techniques employed provide the strength of quantitative analysis while, at the same time preserving the detail and the 'personality' of a more traditional literature review. Even though map analysis and social network analysis are quantitative methods, they compliment the qualitative nature of a traditional literature review by analyzing the relationships between concepts and among researchers. Through analysis of relationships, map analysis and social network analysis do not lose the descriptive strength of more qualitative approaches to literature reviews. In this paper, we have attempted to gain insight into the field of organizational culture by simultaneously applying these approaches. This is similar to the triangulation approach taken by Lievrouw and her colleagues (1987).

A strength of the traditional literature review is that it can provide, through interpretation, a road map linking past studies to future studies, whereas the literature analysis is less likely to provide such a road map. In contrast, the literature analysis (unlike the literature review) provides an empirical register of the structural and consensual integration in the subfield being examined. In this sense, the literature analysis (like that we have done) is complementary to the traditional literature review. Literature analysis potentially provides a couple of insights that contribute to our knowledge and understanding of scientific research. Literature analysis identifies the level of agreement in a field through analyzing texts, and more importantly, it allows us to examine how various social relationships influence the generation of knowledge. In this manner we add more to our understanding by not only being able to state that social relations influence knowledge generation, but being able to describe how different types of relationships influence knowledge generation distinctively or similarly.

We demonstrated the proposed method by examining texts in the area of organizational culture focusing on abstracts and citations. However, the approach we have proposed can be used in other contexts and with other data. For example, on the text side the researcher might focus on interviews or synopses rather than abstracts. And, on the structural side the researcher might focus on other social relationships such as mentoring relationships, same institutional context (e.g., teach at or received degrees from the same university), and so on. Further, in a more detailed empirical analysis the researcher might want to control for other factors such as the prestige of the author's university and whether or not the author sits on an editorial board. The point we wish to make is that a better understanding of the development of scientific fields will require the simultaneous examination of both knowledge and social ties among researchers. The method we have proposed and illustrated is one method for doing this type of analysis.

We observed how the pattern of citations have influenced the conceptualization of culture over time. We focused on the way in which commonalities across authors' mental models are related to their likelihood of citing each other. We observed that over time there has been an increase of activity in the area of organizational culture as evidenced by the steady increase of authors and published texts across time periods. Our results indicate that the conception of culture has expanded, evidenced by more complicated and elaborate textual maps. We find that consensus has grown

over time. This is indicated by the decrease over time in the ratio of unique concepts/statements per time period to the total number of concepts/statements per time period. Further, the fact that there are more concepts shared between the formative and recent years, than between the early and formative years, also indicates a growing consensus. Substantively, much of this consensus is over how to study culture and present the results of this study, rather than over the nature, or impact of, culture. In this sense, much of the consensus that has emerged is rather superficial. Further support for consensus is found in the fact that the formative and recent years share a common definition of culture in terms of norm and values.

Our results also imply that the nature of the disagreements among researchers relating to organizational culture, disagreements that might be taken for a lack of consensus, appear to be regarding how best to refine the culture paradigm that already exists and is more or less taken for granted by the researchers in the area. The growth of this area, evidenced by the increasing number of researchers and ideas, is striking. The consensus we have observed is obscured by this growth. Both a quest for novelty and the generation of new ideas have increased. In fact, the rate of idea creation/novelty claims is much greater than the rate of idea acceptance/consensus. Consequently, those not familiar with the field might not see the core growth of consensus through the morass of new ideas.

Importantly, our results indicate a paradigmatic evolution of the concept of culture within organization theory. This field has progressed from importing the culture paradigm from other social sciences (notably anthropology), to staking a claim that the study of culture is part and parcel of what it means to study organizations, to making assertions about how the culture paradigm should be used to examine organizational phenomena. This progression, suggests that the increasing number of new concepts/statements may be due to this research community writing with the purpose of demonstrating the importance of the phenomenon of interest – culture.

Finally, our results indicate a sense of community building. We also find that over time the relation between citation and shared meaning has grown. This fact, along with the signs of increasing consensus, suggests that we are witnessing the co-evolution of consensus and structure. These two events suggest the possibility that this subfield is going through a process of structuration. We see signs of an increasingly structured subfield dominated by an elite who agrees on core definitions and who have fostered stylistic conventions for representing ideas which serve as gatekeeping mechanisms. Because of the limitations of our data set these findings should be viewed with caution. However, they do suggest the intriguing possibility that the key to the development and success of new scientific specialties, as it is in industry, may be structuration. Future research should examine this point. The methods we have proposed and illustrated can help us to better understand this structuration process.

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