

***LEARNING FROM THE PAST: A REVIEW OF THE
ORGANIZATIONAL MEMORY LITERATURE***

Theme: The Nature of Learning and Knowledge

Casey, Andrea*

The George Washington University

Olivera, Fernando

The University of Western Ontario

Contact author: Casey, Andrea
The George Washington University
2134 G Street NW
Washington, DC 20052

Telephone: 202-994-1152
E-mail: Acasey@gwu.edu

*Names are in alphabetical order. Each author contributed equally to the manuscript

Abstract

Organizational memory is an under-specified, multidisciplinary construct that is well used in academic and practitioner literature. In organizational studies, organizational memory is most often linked with organizational learning, improvisation, and knowledge management. In 1991, Walsh and Ungson brought organizational memory to the attention of researchers and observed that it was a core construct in many organizational theories yet the construct was fragmented. This paper presents the results of analysis of the use of the construct from 1991-2001 to assess whether progress has been made in theoretical development and empirical research. Conclusions are drawn from the literature and promising new approaches and research directions are discussed.

Organizational memory is a central construct in theories of organizational learning and knowledge. In recent years, it has also been a key component in practitioner work related to knowledge management and the learning organization, and has been extended to research in innovation (Moorman & Miner, 1997), accounting (Salterio & Denham, 1997), marketing (Lukas, Hult & Ferrell, 1996), and organizational behavior (Johnson & Paper, 1998). The concept of organizational memory has also been used extensively in the design of computer-based information technologies (Anand, Manz & Glick, 1998; Corbett, 2000). The theoretical foundations of organizational memory draw from several disciplines including psychology (Bartlett, 1932), sociology (Douglas, 1986; Durkheim, 1938/85; Halbwachs, 1950/80; Schwartz, 1991, 2000), history (Crane, 1997; Katriel 1994; Sturken, 1997), and economics (Nelson & Winter, 1982). The assumptions about organizational memory as either a collective process and phenomenon or whether it is primarily based in individual memory are in part reflective of the discipline in which the construct is used.

The review of the organizational memory literature by Walsh and Ungson in 1991 was critical in bringing the construct to the attention of researchers. They defined organizational memory as “stored information from an organization’s history that can be brought to bear on present decisions” (61). They observed that, although memory was a core construct in many theories of organizational phenomena, particularly information processing, the literature remained fragmented and the construct had received limited theoretical development and empirical research. As mentioned above, we have seen increased attention to the construct in recent years. However, has the construct developed in the 10 years after the publication of Walsh and Ungson? Does it remain fragmented? Have we accumulated empirical evidence about the role of organizational memory in organizational functioning? In short, what is the current state of the construct?

Our objective in this paper is to present the findings of our analysis of the literature on organizational memory to assess the use and development of the construct during the 10 years after the publication of Walsh and Ungson (1991) as well as to identify gaps and new directions for research on organizational memory. We present analysis of the use of the construct in the period of 1991-2001. We draw conclusions with respect to the state of the construct, identifying promising research directions, and discuss the implications of our analysis.

Organizational Memory 1991 - 2001

In their review of organizational memory, Walsh and Ungson (1991) observed that the construct was fragmented and underdeveloped, a concern that other researchers have echoed over the years (Ackerman, 1996; Spender, 1996; Stein & Zwass, 1995). Walsh and Ungson (1991) provided a framework for conceptualizing organizational memory as well as guidelines for developing empirical research that could help us develop our understanding of the construct. Has the construct developed in the 10 years following the publication of Walsh and Ungson's review? What empirical evidence have we accumulated about the existence of the structure, functions and processes of organizational memory?

One way to assess the development of a construct is to analyze the way in which it is used in the academic literature. We analyzed all journal articles published in the academic business literature between 1991 and 2001 that used the term "organizational memory." Our focus was on determining the role (from peripheral to central) that the construct played in the literature and the extent to which there was evidence of conceptual development and empirical assessment of the construct. We were also interested in assessing the use of the construct across different fields related to organizations and, to that aim, we included in our search all management disciplines, including information systems, marketing, operations research, accounting, etc. Finally, we explored changes in the use of the construct over time. Has the use decreased or increased over time? Has interest faded in one field but increased in another?

In the following sections we describe the method we used to identify and classify published research on organizational memory. We present a conceptual framework, based on work by Morgeson and Hofmann (1999) and Parsons (1951), which we used to synthesize and analyze the development of the construct. Finally, we discuss our findings and provide suggestions about future research directions.

Method

Journal articles using the terms "organizational memory" or "organisational memory" were identified through electronic search using ProQuest. The parameters of the search were set to identify peer-reviewed publications that used the term anywhere in the text, title, abstract or references. The search was conducted in June of 2002, at which time publications dated through 2001 would have been included in the database.

The search resulted in 437 articles. Of those, 113 were discarded from the analysis for the following reasons: First, several were not actual journal articles but, for example, book reviews, interviews or editorials. Second, in several cases the term "organizational memory" appeared only in the researcher's biographical information (e.g., as a research interest), rather than in the article itself. Third, in several articles the term appeared only in references but inspection of the article revealed that the reference was not cited in relation to organizational memory. For example, an article by Moorman and Miner (1997) that includes the term "organizational memory" in the title was often referenced in relation to product development, but not in relation to organizational memory. Finally, the search yielded articles from the field of computer science where the term organizational memory was used in to refer to computer components and were thus discarded. We included articles that discussed

organizational memory as a part of knowledge management and databases as forms of memory. The final sample of 324 articles includes only those in which the words “organizational memory” were used in relation to the construct.

This approach presented above for surveying the literature has several potential limitations that are worth acknowledging at this point. First, the electronic search does not identify articles from publications that are not part of the ProQuest database. Further it is likely that not all publications included in the database are indexed for the entire period of the search. As a result, articles identified through ProQuest may only partially represent the literature and significant omissions may be made. With respect to whether our search yielded a representative scope of publications, we note that the articles identified were from 117 different publications. These publications were from a wide range of disciplines (including accounting, education, human-computer interaction, operations research, ethics, international business, etc.), different orientations (practitioner and academic, case-based, qualitative and quantitative), and many were international (e.g., from Australia, Canada and Europe). In this respect, we are confident that the search yielded a representative, if not complete, sample of the work that has been published on the construct.

To investigate whether there were important omissions from our search – for example, due to limitations in indexing by journals – we identified all the sources that were referenced in relation to organizational memory in all articles published from 1999 to 2001. The rationale for this analysis was that any significant reference on organizational memory would likely have been cited in the 133 articles that were published in that period. In these articles, 35 sources were referenced in relation to organizational memory. Walsh and Ungson (1991) was the source cited most frequently, 18 times, followed by Moorman and Miner (1997), which was cited 13 times. Comparing this list of sources to the results of the ProQuest search led to identification of only one other journal article that was published between 1991 and 2001: Huber’s (1991) article which was published in *Organization Science*. The omission of this article from the ProQuest search is likely due to lack of indexing for articles of that period in *Organization Science*. Since this may also be the case of other journals, we consider our findings, particularly in the years close to 1991, to be only partially representative of the literature. We are confident, however, that our search yielded most of the articles that have had some impact in the field (as defined by subsequent citation).

Second, our analysis does not include work that has been published in books and conference proceedings. We know that significant work has been published in such outlets, such as the Proceedings of the Annual Hawaii International Conference on System Sciences where there has been an organizational memory track for several years. While we recognize the importance of these publications, we believe the influence of this work manifests in journal publications in at least two ways. First, several articles from conference proceedings were eventually published as journal articles (e.g., Ackerman & Halverson, 2000). Second, authors of journal publications build on ideas presented in these outlets (e.g., Corbett, 2000) and thus partially capture the development of the construct in those forums. In sum, while we recognize the limitations of our approach to surveying the field, and take it into consideration in our analysis and conclusions, we believe that this search provides a useful representation of the state and development of the construct.

Coding of Articles

As a first step, articles were coded with respect to the role that the construct played in the article. The coding scheme was developed to differentiate articles where the construct played a peripheral, substantial or central role. Articles were coded as peripheral in cases where the construct played a minor role in the theory, analysis or discussion presented. In most of these cases, the construct was mentioned only once or twice and, usually, in connection with organizational learning constructs. A distinguishing feature of articles coded as peripheral is that the construct of organizational memory was not used to develop hypotheses or propositions or otherwise explain the phenomena studied. Another feature was that very few of the 260 articles coded as peripheral presented a definition of organizational memory. In all other cases, although the construct was used in meaningful ways, it was not defined or elaborated on. For example, in Ofori-Dankwa and Julian's (2001) discussion of time research and organizational theory, they mention the potential impact of organizational memory and on learning and performance, but organizational memory is not defined and is not a central construct in the article itself.

In articles that were coded as substantial the construct was used in the development of theoretical propositions or interpretation of findings. In contrast to articles coded as peripheral, the construct was used explicitly to conceptualize or interpret phenomena. Although not in all cases, a definition of the construct was often presented. The main topic of these articles, however, was not organizational memory. For example, Glynn (1996) used Walsh and Ungson's (1991) definition of organizational memory and discussed its relationship to innovation and diffusion of knowledge in organizations. O'Neill and colleagues (O'Neill, Poudier & Buchholtz, 1998) used the construct to develop a proposition about the role of organizational memory in adoption of strategies from the environment. Although most articles coded as substantial provide definitions of organizational memory, there were a few exceptions. For example, Snyder and Cummings (1998), in their explanation of organizational learning disorders, references organizational memory and Walsh and Ungson (1991) yet doesn't define the term. We coded 33 articles as making substantial use of the construct.

Articles were coded as central if the main topic of the article was organizational memory. In most of these articles the term was used in the title and in all cases a stated objective was the study of organizational memory. Appendix A lists the 27 articles that were coded as central.

This coding scheme was developed jointly by the researchers. The coding was piloted on 15 articles with each researcher coding separately and then the articles were re-coded by the second researcher. Some differences arose and assisted in further description and refinement of the codes. Articles were initially organized chronologically and numbered; they were then classified in various fields depending on the journal in which they were located. One researcher coded odd-numbered articles while the other researcher coding even numbered. After all articles were coded, the coded articles were re-evaluated by the other researcher, beginning with those coded as peripheral. If there were differences in the coding, the choice was to be conservative. For example, we would code an article that was possibly substantial as substantial instead of peripheral. The articles coded as central or substantial were re-read and coded by the other researcher.

Results

Table 1 shows the number of articles for which the organizational memory construct played a peripheral, substantial and central role for the years 1991-2001. The construct was peripheral in the vast majority of articles (82% overall). After 1994, there has been a small, but constant number of publications that use the construct in central or substantial fashion.

With respect to academic disciplines, Table 2 shows the proportion of articles in the following fields: organizational behavior and theory, information systems, operations research, marketing, knowledge management, international management, accounting and communication. The “other” category includes articles areas such as education and library sciences. In addition, a number of articles were classified as practitioner-oriented, mainly in the organizational behavior field.

Of the articles in which organizational memory plays a substantial or central role, the vast majority were conceptual, rather than empirical. Of the fourteen empirical articles, eight were from organizational theory journals with the others scattered across information systems and marketing and accounting journals. Seven of the fourteen empirical articles were coded as central and of those seven, three were in organizational theory journals, two were in information systems journals, one in marketing, and one in accounting. Of the empirical papers, most are qualitative. Ten studies used a case study design of a single organization and qualitative methods. Only two studies attempted to quantify and test the effects of organizational memory (Moorman & Miner, 1997 and Berthon, Pitt & Ewing, 2001).

Analysis

What have we learned about organizational memory from literature in this ten-year period? With respect to the large number of articles in which the concept of organizational memory plays only a peripheral role, we can conclude that the construct has had sufficient intuitive appeal to become part of the academic discourse in a wide range of disciplines. In many of these articles, the nature and relevance of the construct are taken for granted. The constructs is rarely defined or cited. For example, authors mention the negative effects of turnover on organizational memory (e.g., Appelbaum and Gallagher, 2000) or how the individuals with long tenure aid in the preservation of organizational memory (Adler & Zirger, 1998). Researchers also allude to the role of files, routines and technology as means for preserving organizational memory (e.g., Reed, 1993). Others mention the role of organizational memory in resistance to change (e.g. Greve, 1998). Organizational memory, however it was described, was most frequently discussed as a critical component of organizational learning (e.g. Hendry, 1996). In these cases the construct was used to structure theoretical arguments about organizational phenomena. It is worth noting, however, that underlying these arguments are assumptions about functions of organizational memory that remain largely untested. In addition, assumptions about organizational memory are frequently based on our understanding of human memory which may confound our theorizing regarding organizational memory and how it is structured and functions (Ackerman, 1996; Corbett, 2000).

Articles for which organizational memory plays a substantial or central role provide useful insights about the development of the construct, and the following analysis is based primarily

on these articles. Of the 60 articles coded as central or substantial, 36 were conceptual, 10 were practitioner-oriented (nine in organizational behavior and one in information systems), and only 14 were empirical studies. As we will discuss below, this research remains fragmented, with advances in different fields but little dialogue among fields. One objective of the following sections is to provide some needed integration of the ideas developing in these separate streams of research.

Morgeson and Hofmann (1999) provide a framework for conceptualizing collective constructs that is useful for summarizing and integrating the literature on organizational memory. They argue that collective constructs need to be understood in terms of two fundamental elements: function and structure. The function of a collective construct refers to “the causal outputs or effects of a given construct” (Morgeson & Hofmann, 1999:254). A function of organizational memory is, for example, the recollection of past events. The structure of a collective construct refers to the interactions among organizational members and the processes that underlie these interactions that result in the emergence of the collective. Morgeson and Hofmann (1999:252) note that “the structure of any given collective (e.g., a work team) can be viewed as a series of ongoing events, and event cycles between the component parts (e.g., individuals).” They illustrate the structure of organizational memory as being made of interactions among individuals that, through processes of probing (their own memories and the organization’s information systems) and sensemaking result in the recall of past events.

It is worth noting that viewing organizational memory in terms of functions and structure allows us to develop insights about the construct beyond the framework proposed by Walsh and Ungson (1991). Walsh and Ungson’s (1991) emphasis was on the location and contents of organizational memory. They proposed the concept of storage bins as a way of organizing our thinking about where organizational knowledge resides. They also differentiated among categories of knowledge (what, why, when, etc.) that these bins could contain. Their framework, however, did not address the processes by which organizational memory is formed (i.e., in Morgeson and Hofmann’s terms, its structure) or how organizational memory affects organizational phenomena (i.e., its functions).

What does recent research tell us about the functions and structure of organizational memory? In the next section we present our findings related to the function of organizational memory from the articles coded as central or substantial, followed by the ideas that reflect the structure of organizational memory.

In their review of organizational memory information systems, Stein and Zwass (1995) argued for the importance of drawing links between organizational memory and organizational effectiveness. Their definition of organizational memory, which builds on Walsh and Ungson’s (1991), makes an explicit link between memory and effectiveness by stating that “we consider organizational memory to be the means by which knowledge from the past is brought to bear on present activities, thus resulting in higher or lower levels of organizational effectiveness” (Stein & Zwass, 1995: 89). Although their position on the contribution of organizational memory to effectiveness is ambivalent, a key contribution of their approach is the attention given to the types of organizational functions that organizational memory may support. More specifically, they draw on Parsons’ (1951) typology of organizational functions (integrative, adaptive, goal attainment and pattern maintenance functions) to draw the links between organizational memory and organizational

effectiveness. Their basic argument is that organizational memory is relevant for each of the four functions.

We follow the approach taken by Stein and Zwass (1995) and use Parsons' framework to organize our findings with respect to functions of organizational memory. Parsons' work on social systems is widely used in the development of organizational theory (Burrell & Morgan, 1979) including models of organizational culture (Schein, 1992), organizational effectiveness (Dennison, 1990; Quinn, 1990), and organizational learning (Schwandt, 1997). Parsons' theory of action proposes change in social systems is a function of learning and performance. In order for a social system of action to survive it must perform the following four functions:

adaptation – actions taken by the organization to relate to its external and internal environments including bringing information into the system

goal attainment – actions take by the organization to set and meet goals

integration – actions taken to coordinate the organization's activities

pattern maintenance – patterns of action or culture.

In the following sections we discuss insights drawn from the literature with respect to how organizational memory serves each of these four functions.

Functions of Organizational Memory

Adaptation

Few researchers have explored the extent to which organizational memory supports adaptation. Improvisation or the ability of a firm to create new solutions to problems is an adaptive function in changing environments. Moorman and Miner (1998) looked at the relationship between organizational improvisation and organizational memory. They maintain that organizational memory is particularly relevant to improvisation “because of the convergence of composing and acting” and “there is less time ...to purchase or develop knowledge and skills necessary to complete action” (Moorman & Miner:715). The categories of memory discussed are procedural and declarative knowledge and are used to support the function of improvisation depending on how and where this knowledge is retained.

Moorman and Miner (1997) also investigated the relation between organizational memory and new product development, creativity, and financial performance. Although the main focus of their study was on the integrative and pattern maintenance role of memory on product development, they theorized about the moderating role of environmental conditions on the relationship between memory and product performance. Specifically, they hypothesized that the greater the technological turbulence in the environment, the weaker the positive (or negative) effects of organizational memory on product creativity and financial performance. Their empirical findings suggest that under conditions of high turbulence, a high degree of homogeneous knowledge throughout the organization (high memory dispersion) detracts from creativity but under conditions of low turbulence, homogeneity enhances creativity. Moorman and Miner's (1997) arguments and findings suggest that

organizational memory can both facilitate and interfere with adaptation to the external environment.

Other researchers have considered the dual effects of organizational memory on adaptation. In a simulation study, Lomi and colleagues (Lomi, Larsen, & Ginsberg, 1997), explored the role of experience on adaptive learning. They tested the assumption that experience should serve as a guide for effective decision making. Organizational memory plays a role in the adaptation process as an imperfect mechanism for encoding inferences drawn from experience into routines that guide future actions. The results of their simulations underscore the potential negative effects of experience (and, implicitly, organizational memory) on adaptive learning given the complex and dynamic nature of organizations (due to, for example, nonlinearities, time delays, and feedback misperceptions). O'Neill and colleagues (O'Neill et al., 1998) argued that organizational memory affects the adoption of new strategies in two ways. First, memory will determine in part types of information from the environment to which the organization will pay attention. Second, the costs of adopting a new strategy are related to the extent to which the strategy is consistent with the structure of the organization's memory, such that consistent strategies will be adopted faster and more efficiently.

Also related to adaptation, researchers in marketing have argued for the role of organizational memory in explaining learning in marketing channels (Lukas, Hult & Ferrell, 1996). Building on Walsh and Ungson's (1991) framework, these researchers proposed that elements of a marketing channel, such as firm-to-firm ties, can serve to preserve knowledge and facilitate learning.

Goal attainment

Walsh and Ungson (1991) emphasized the role of organizational memory in decision making, and some researchers have explored the extent to which memory affects how managers make decisions. Research in information systems has placed a heavy emphasis on the role of technology-based memory systems in providing support for problem solving and decision making (Anand, Manz & Glick, 1998; Corbett, 2000; Croasdell, 2001; Hackbarth & Grover, 1999; Stein & Zwass, 1995; Wang, 1999; Weiser & Morrison, 1998). Much of this research has been conceptual and focused on the design principles that should guide the development of effective technology-based organizational memory systems. Bordetsky and Mark (2000), for example, used the concept of organizational memory, as developed by Stein and Zwass (1995) to develop technologies to support collaboration through groupware.

Other researchers have explored the role of organizational memory on cognitions of decision makers. Berthon and colleagues (Berthon, Pitt & Ewing, 2001) proposed that organizational memory has an effect on how decision makers perceive their environment. More specifically, they argued that managers in organizations that have an extensively developed memory system are likely to perceive their environment as highly structured. Although the authors find support for this argument in their empirical study, the finding should be interpreted with caution. Organizational memory is measured indirectly as a combination of organizational age and size, which raises the possibility of alternative explanations that have no relation to the functioning of organizational memory.

Other articles discussed organizational memory in terms of information systems and the importance of structuring these systems by aligning them with goals, environmental issues and needs of the individuals in organizations (Goodman & Darr, 1996; Markus, 2001; Wijnhoven, 1999). This type of organization memory would support the organization's efforts to attain goals as well as be an integrating function for the organization. Organizational memory is also used for problem solving (Ackerman, 1996; Goodman & Darr, 1996), another goal attainment function.

Integration

Some researchers have explored the role of organizational memory as a means for integrating dispersed organizational knowledge. Olivera (2000), for example, analyzed the mechanism used in a large organization to collect, store and provide access to dispersed organizational experience. These mechanisms, which included social networks, corporate knowledge centers, intranets and other computer-based systems, were conceptualized as forms of organizational memory.

Research in information systems has also conceptualized various computer-based systems as forms of organizational memory. Goodman and Darr (1996), for example, studied how corporate databases served to exchange and store best practices in large, geographically distributed organizations. These technologies allowed for the integration and storage of otherwise dispersed knowledge.

Also focused on the role of information systems, Anand and colleagues (Anand, Manz & Glick, 1998) provided a framework for thinking about the integrative function of organizational memory. Their framework builds on the concept of group transactive memory (Wegner, 1995), which is based on the distinction between knowledge held by group members and their knowledge (or meta-knowledge) about who knows what in the group. Following this principle, organizational memory can be conceptualized in terms of dispersed knowledge and the pointers to where knowledge resides in the organization (see also Olivera, 2000).

Research on new product development also provides insights about the integrative function of organizational memory (Hargadon & Sutton, 1997; Moorman & Miner, 1997; Sutton and Hargadon, 1996). Organizational memory plays a role in product development by providing a means for integration of ideas that result in creative, new products. The work by Hargadon and Sutton (1997), for example, suggests that organizational memory provides reminders of previous designs and the opportunity for the combination of old solutions to problems into innovative solutions to new design problems. Moorman and Miner (1997) also propose effects of memory dispersion on the creativity of new products.

Pattern Maintenance

This function is most frequently addressed in terms of the degree to which organizational memory is shared by members of the organization. The degree of sharedness or dispersion has been addressed in terms of shared mental models (Kim, 1993) and by others who propose that organizational memory is housed in culture, structure, and roles in the organization (van der Bent, Paauwe & Williams, 1999). Organizational memory described in these terms supports the stability of the patterns of action represented by this subsystem. Van der Bent

and colleagues (van der Bent et al., 1999:394), for example, argued that “Memory is a basic source of stability upon which change managers can rely.” Haleblan and Finkelstein (1999) and Weiss (1999) project that organizational memory is preserved even when key members leave an organization or in high-turnover organizations. Other categories of organizational memory that support the pattern maintenance function include standard operating procedures (Cyert & March, 1963), routines (Nelson & Winter, 1982), and stories (Casey, 1997).

Theories of organizational memory that view it as an aggregation of individual memories instead of a collective process, propose a counter argument i.e., when individuals leave a company, “chunks” of organizational memory are lost from a social network (Fisher & White, 2000), and therefore organizational memory might not support pattern maintenance. These theories link it to the importance of the individual in giving it meaning (Glazer, 1998; Holmqvist, 1999) and the impact of individual communication styles may impact how events are recalled and related (Clampitt, DeKoch, & Cashman, 2000).

Structure of Organizational Memory

Adaptation

We described above the conceptual arguments that researchers have made with respect to the role of organizational memory in adaptive functions such as improvisation, innovation, adaptive learning and inter-organizational learning. These arguments have been developed in terms of broadly conceived relationships between adaptive responses and organizational phenomena. For example, Moorman and Miner (1997:96) argue that “[environmental] turbulence is likely to reduce the value of prior learning.” These studies, however, have not delved into the processes that explain the links between organizational memory and adaptive responses. The empirical studies have been cross-sectional and have not attempted to measure or explain underlying processes or interactions. The simulation by Lomi and colleagues (Lomi et al., 1997) provides some insights about the processes that may explain the lack of adaptation of decision makers in dynamic environmental conditions, such as misinterpretation of feedback) that may provide a promising avenue for further theorizing and empirical testing.

Goal Attainment

Research in information systems and human computer interactions provides insights about the structure of memory as it relates to goal attainment functions. Although the emphasis of most studies in these fields has been on developing prescriptions for the design of technology-based memory systems, some researchers have explored the micro-processes underlying how individuals interact with their information environment to solve problems and make decisions. Ackerman and Halverson (2000), for example, provide a detailed account of how an operator in a telephone helpline used various memory devices to solve a problem. Their analysis underscores the complexity of how organizational memory affects individual goal attainment. What appears to be a simple task (answering a call) can be interpreted as a manifestation of multiple aspects of organizational memory operating simultaneously affecting the operator’s behavior. The picture that is drawn in this research is one where the structure of memory is dynamic and interactive. The operator’s activities are supported by individual, group, and organizational memory. The operator re-contextualizes knowledge from the organization’s memory and may subsequently de-contextualize it.

The study by Randall and colleagues (Randall, Hughes, O'Brien, Rouncefield & Tolmie, 2001) also provides detailed analysis of the micro-processes behind the goal attainment functioning of organizational memory. Their focus is on understanding "knowledge acts," instances where individuals interact with organizational knowledge. Examples of these acts are situations where individuals need to know how to perform a task, who has relevant knowledge, and the extent to which current situations are like past situations. Their analysis of how bank operators perform this knowledge acts illustrates some of the underpinnings of how organizational memory supports their work.

Corbett's (2000) conceptual work on the links between individual and organizational memory provide further insights about the structure of organizational memory. His approach is also anchored on understanding how individuals' remembering both affects and is affected by the organizational context. He draws the distinction between personal memory (which comes from personal experience), cultural memory (which relates to the identity of the collective), and prosthetic memory (which is derived from the experiences of others). These forms of memory are, in his view, inextricably intertwined and work in a dynamic way to produce remembering at the individual and collective levels.

Integration

Studies that have explored the integrative function of organizational memory have also provided some insights about the structure behind this function. Olivera (2000) described processes by which knowledge was collected, stored and maintained in organizational memory systems. For example, he described how social networks were shaped by the work experiences of individuals, corporate training, and the use of communication media in the organization. These processes explain in part why and how social networks are a form of organizational memory that serves to integrate dispersed knowledge. In a similar vein, Goodman and Darr (1997) explain the processes by which a corporate database both collects and provides access to best practices generated by geographically dispersed individuals. Features of the contribution process (such as the amount of effort it involved), the nature of the problem domains (such as complexity) and characteristics of the system all contributed to shaping the functioning of the database as a form of organizational memory.

In the context of product development, Sutton and Hargadon (1996) provide a rich description of how interactions among developers, objects, and organizational practices (e.g., brainstorming sessions) interact to produce innovative ideas. The structure of organizational memory can be explained in terms of these interactions, where groups systematically access knowledge about previous products and ideas and combine them to create new ones.

Pattern Maintenance

As noted earlier, organizational memory most frequently functions as a key component in organizational learning and change (Lomi et al., 1997; van der Bent et al., 1999), ultimately affecting organizational effectiveness. The ideas about how it affects organizational change are mixed with some suggesting that organizational memory functions as a form of inertia and stability while others propose that it may facilitate change, learning (Wijnhoven, 1999) and organizational flexibility (Elofson & Konsynski, 1993).

Discussion

The results of our analysis indicate that organizational memory is a construct that continues to be used widely in the organizational studies literature. Further, the use of the construct has spread to fields as diverse as marketing, operations research, international management, and accounting. Yet, we have seen little theoretical development and integration of the construct; only 27 articles in the 10 years following the publication of Walsh and Ungson's (1991) review take organizational memory as a central concern of study. In the vast majority of articles, the construct is used only peripherally and, perhaps more importantly, the use often implies untested assumptions about its functioning. There is scant evidence from empirical research about how organizational memory functions, suggesting that our understanding of organizational memory does not match its widespread use. Below we elaborate on specific themes that emerged from our review of this literature.

World Views

Assumptions about how knowledge or memory is created and whether it can be stored represent epistemological and ontological assumptions (i.e., the world views) of the theorists. As we acknowledged earlier in this paper, one of the limitations of this review is that we narrowed our search to the business literature available through ProQuest. The preponderance of theory and research in the business literature is framed within a similar world view or assumptions about the nature of reality and of knowledge and how they are created. This frame excludes world views that may be more prevalent in other disciplines which are not represented in our ProQuest search.

Burrell and Morgan (1979) elaborated on the connections between world views or paradigms and their influence on theories and research in sociological and organizational theory. They suggest that organizational theories can be traced back to ontological and epistemological assumptions about the world and the extent to which individuals create or are determined by their environments. They delineated four paradigms representing four different sets of key assumptions: functionalism, interpretivism, radical humanism and radical structuralism. There is divergence within the paradigms but an "underlying unity" within the paradigm is maintained. Burrell and Morgan use these four paradigms as a lens to understand the relationships and differences between sociological and organizational theories and propose that the majority of this work has been conducted within one primary paradigm i.e. functionalism, and to a lesser degree the remaining three paradigms. In our review, functionalism was the predominant world view.

Functionalism is rooted in "regulation and approaches its work from an objectivist perspective" (Burrell & Morgan, 1979: 25) focusing on explanations related to maintaining social order, rational explanations and pragmatic knowledge that can be used in organizations. Housed in this paradigm are systems theories (information systems work on organizational memory, organizational learning based on systems theories, sociotechnical systems theories), and social action theory (Parsons). In our review, representative examples are theory and empirical work on memory in information systems (Anand, Manz, & Glick, 1998, Goodman, 1996) and memory systems (Olivera, 2000).

We noted that researchers are paying attention to the effects that organizational memory has on organizational functioning, assuming its existence and importance. This focus is in

contrast to theoretical debates - for example, about whether memory can be conceptualized at the organizational level or whether memory can reside outside of individuals' heads - that characterized much of the discourse of the 1980s and early 1990s. We believe the recent attention to the functioning of organizational memory should be welcomed for several reasons. Focusing on the functions of memory underscores the critical role that memory can play in organizational phenomena and, thus, can contribute to our broader understanding of organizational effectiveness. We believe that if the construct of organizational memory is to survive the passage of time, it should be because it brings clarity and understanding to organizational phenomena. An attention to functions is likely to take the construct in that direction.

Additionally, an emphasis on functions may facilitate integration of theories and findings across fields by focusing the attention of researchers interested in the same organizational phenomena, but from different perspectives. For example, drawing links between memory and innovation not only sheds light into the functioning of organizational memory, but also calls for an appreciation of how researchers in other domains explain the role of organizational context on innovation. Following arguments by Morgeson and Hofmann (1999), we believe that connections to related phenomena can contribute to the development of the construct's nomological network and thus help us further delineate its meaning. In other words, a focus on functions opens up opportunities for dialogue among researchers.

The interpretivist paradigm emerged as the second largest contributor to theories and research on organizational memory. As a relatively underexplored construct, organizational memory lends itself to multiple interpretations yet the work remains framed for the most part within the set of assumptions about regulation or control (interpretive paradigm). This might account for the lack of explicit theorizing about relationships between power and organizational memory yet power is implicitly referred to in functionalist terms such as authority and managerial control of knowledge. Work framed within the interpretive paradigm seeks to achieve a subjective understanding of the world as an "emergent social process which is created by individuals" (Burrell & Morgan, 1979: 28) yet is also "cohesive, ordered and integrated" (Burrell & Morgan, 1979: 31). Research methods focus on "the detailed study of the world of everyday life" (247) and provide the "the ordered nature of the social world" (Burrell & Morgan, 1979: 249). Examples of theories and research on organizational memory reflecting this paradigm are found in those that see memory housed in the interactions of groups as in Hargadon and Sutton's work on technology brokering and innovation in product development teams as well as in work that surfaces organizational memory as part of the culture of an organization such as Corbett's (2000) work on culture as a "memory carrier" or research on organizational stories (Boje, 1991; Casey, 1997) as a form of organizational memory.

The remaining two paradigms, radical humanism and radical structuralism, are the least developed in organizational theory (Burrell & Morgan, 1979) and were not represented in the articles reviewed in our research. Radical humanism is also interpretative but the emphasis is on "overthrowing or transcending the limitations of existing social arrangements" (Burrell & Morgan, 1979: 32). The underlying assumption is that our consciousness is "dominated by ideological superstructures" (32) and radical change and emancipation are need to free humans from domination and oppression (306). Radical structuralism also advocates for radical change but with an emphasis on objectivism. The emphasis is on overturning objective social structures through surfacing "fundamental conflicts that generate radical

change through political and economic conflict” (Burrell & Morgan, 1979: 24). Power is integral to the radical paradigms.

Theoretical work grounded in radical humanism and structuralism are underrepresented in the organizational theory literature yet are promising alternatives to further our understanding of organizational memory. For example, in the sociological literature, collective memory has been a major research stream in sociology. There are many conflicting world views represented in this literature one of which is the post modern view of collective memory with its emphasis on the politics of memory and theorizing regarding the influence of power on collective memory. Power, as a construct, did not surface directly in our review of the literature on organizational memory.

Space

The first theme relates to the role of space in organizational memory. More specifically, it deals with the shared versus dispersed nature of organizational knowledge. Some researchers conceptualize organizational memory in terms of that which is shared and characterizes the organization as a whole, such as stories, routines or standard operating procedures that are embedded in culture, as well as organizational structures (e.g., Haleblian & Finkelstein, 1999; O’Neill et al., 1998; van der Bent, 1999), or social actions. In contrast, other researchers focus on what is dispersed and the mechanisms through which dispersed knowledge and experience are integrated. Such is the approach of researchers who study transactive memory (Anand et al., 1998), social networks (Cross & Baird, 2000) and computer-based information systems (Stein & Zwass, 1995).

These two approaches reflect underlying assumptions or world views about what constitutes organizational memory as well as how memory is created and structured. For example, Fisher and White’s (2000) study on the impact of downsizing on organizational learning drew from social network theory and assumed that organizational memory is more than the aggregation of individual knowledge and memories. They speculated that organizational learning is an emergent process based on networks rather than knowledge transferred from one person to another. Their underlying assumption is that downsizing does more than take the individual and his/her knowledge from the organization but rather disrupts networks of learning.

Our view is that the study of organizational memory requires recognizing both its shared and dispersed nature. Some researchers, such as Moorman and Miner (1997), have attempted to incorporate this consideration in their studies by measuring both the level and dispersion of organizational knowledge. (It is worth noting, however, that they rely on aggregation of perceptions of individuals to obtain measures of organizational memory.) For the most part, the two approaches have developed independently. In some cases, the approaches have separated entirely from the concept of organizational memory. For example, recent studies on organizational routines (e.g., Feldman & Rafaeli, 2002) and transactive memory (e.g., Rulke, Zaheer & Andreson, 2000) do not draw links to the concept of organizational memory. In terms of future research, we see here opportunities in exploring how the shared and dispersed jointly affect the structure and functioning of organizational memory. For example, how do contextual factors affect the interpreting and enacting of organizational routines? How do routine activities affect the formation of transactive memory systems?

Time

We were surprised to find that none of the articles we reviewed gave serious consideration to the construct of time. Organizational memory, by definition, implies the passage of time and yet this dimension has received, to our knowledge, no attention in the literature. Several questions are pertinent with respect to the role of time in the functioning of organizational memory. First, does organizational memory decay over time? As we pointed out before, there is an (untested) assumption that decay in organizational knowledge is related to the departure of individuals from the organization. There is no articulation, however, about how the passage of time is likely to affect the collective ability to recall past events. Second, to what extent are organizations better able to recall recent events versus those that are distant in time? There is some evidence that recent events are more likely to be recalled in organizations (Casey, 1997) and yet this phenomenon has received little attention in the literature. Third, how do organizational cycles affect the structure and functioning of organizational memory? Project cycles create opportunities for encoding experiences into organizational memory. Also, recurrent activities may compensate for the natural decay in organizational knowledge. Consider, for example, the function of fire drills in maintaining organizational knowledge about how to respond to such incidents. Once again, we know little about how cycles and recurrent activities relate to organizational memory. Finally, how does consideration for the future affect the structuring of organizational memory? Corporate museums are likely built with intentions of permanence (Nissley & Casey, 2002). In contrast, post-mortems at the end of projects may be done with short term considerations. These questions illustrate some of the gaps in our current thinking about organizational memory. This gap may be due in part to the lack of frameworks for thinking about the role of time in organizations. There have been, however, considerable developments in the study of time, as evidenced by the recent special issues in the *Academy of Management Review* and *Journal* on the topic of time in organizations. We believe that consideration of time is an exciting opportunity for further theorizing on organizational memory.

Power

As noted above, the role of power in organizational memory is a missing theme in the research we reviewed. In this review, this is most likely due to our emphasis on business literature primarily represented in English language journals. Burrell and Morgan indicate that “most social systems theories completely ignore the issue of power within organizations” (1979: 207) with the focus on status quo and functions that assist in unifying the organization. The articles reviewed for this paper are primarily written from the world view of managers or administration with the intent to create more efficient and effective organizations versus humanizing the workplace and helping individuals break free from ideological and structural bonds.

An extensive literature in organizational theory has recognized the role of power in shaping organizational structures and processes (e.g., Pfeffer & Salancik, 1978). There has been, however, relatively little work on how power affects organizational learning and related concepts (Vince, Sutcliffe & Olivera, 2002). Power relations are likely to affect both the structure and functioning of organizational memory. Power, for example, is likely to affect the interactions among actors that are the underpinnings of memory structures. Consider, for example, the problem of knowledge ownership in organizations. Who owns the knowledge that is produced in the process of work? There is a natural tension between owning

knowledge as individuals and yielding it to the organization. Power is also likely to affect what is remembered (both purposefully and automatically) by organizational members. The adaptive or non adaptive effects of memory may be due in part to the extent to which change affects power relations and how those who are affected evoke the past to resist change. How the past is brought to bear on present decisions is likely to be affected by how the past affects the interests of decision makers. Researchers have yet to consider how power affects organizational memory. We see this as a further opportunity for future research.

Conclusions

Despite the progress, there is still evidence of fragmentation in the literature. Research in organization theory, marketing and information systems, although departing from the same point, seems to be developed in isolation. This phenomenon, of course, is symptomatic of the barriers in collaboration and cross-fertilization that characterize academia. However, we believe there are opportunities for further integration among fields. A review of the literature such as this one hopefully contributes to an appreciation and acknowledgement for the progress in various business fields. To a lesser degree, it may contribute to developing an understanding of the contributions that have been made by various researchers. The greater challenge in a fragmented field is integrating the insightful theoretical and empirical work underway in the broader domain of other disciplines such as sociology, anthropology, and history, where the foundation is truly in the collective and social systems. Other collective constructs in organizational theory, such as culture, organizational identity, and power have successfully drawn upon these disciplines in their theorizing.

The construct of organizational memory continues to appeal to researchers. Our analysis of the business literature on organizational memory from 1991-2001 reveals extensive interest in the construct reflected in the more than 300 articles across disciplines that to a greater or lesser degree make reference to it. The analysis also reveals, however, limited integrated conceptual and empirical development of the construct. The promising future directions noted should help us build an understanding of our past in organizational theorizing on the construct as well as our future.

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Table 1

Summary of Articles Coded as Peripheral, Substantial and Central, Years 1991-2001

Year	Peripheral	Substantial	Central	TOTAL
1991	2	1	1	4
1992	7	0	0	7
1993	10	3	0	13
1994	15	2	0	17
1995	19	0	2	21
1996	20	4	4	28
1997	38	2	3	43
1998	47	7	5	59
1999	33	6	4	43
2000	50	5	5	60
2001	24	3	3	30
Total	265	33	27	325

Table 2

Summary of Articles by Academic Discipline, Years 1991-2001

Discipline	All Articles	Substantial And Central
Organizational Behavior and Theory	110	20
Information Systems	64	22
Operations	37	1
Organizational Behavior - Practitioner	33	9
Marketing	28	5
Knowledge Management	28	2
International Management	12	0
Accounting	6	1
Communication	3	0
Other	4	0
Total	325	60

Appendix A

Articles Coded as Central

- *Ackerman, M. S. 1996. Definitional and contextual issues in organizational and group memories. *Information, Technology, and People*, 9(1): 10-24.
- *Ackerman, M. S., & Halverson, C. A., 2000. Reexamining organizational memory. *Association for Computing Machinery, Communications of the ACM*, 43(1): 58-64.
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