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## ORGANIZATIONAL MEMORY

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**In this article we argue that the extant representations of the concept of organizational memory are fragmented and underdeveloped. In developing a more coherent theory, we address possible concerns about anthropomorphism; define organizational memory and elaborate on its structure; and discuss the processes of information acquisition, retention, and retrieval. Next, these processes undergird a discussion of how organizational memory can be used, misused, or abused in the management of organizations. Some existing theories are reassessed with explicit attention to memory. The paper closes with an examination of the methodological challenges that await future researchers in this area.**

If an organization is to learn anything, then the distribution of its memory, the accuracy of that memory, and the conditions under which that memory is treated as a constraint become crucial characteristics of organizing.

—Karl E. Weick (1979a: 206)

Despite the fact that memory remains one of the core concepts in information-processing theories (Johnson & Hasher, 1987; Richardson-Klavehn & Bjork, 1988; Shannon & Weaver, 1949), the understanding of this concept is limited, particularly in theories about organizations. Specific theories have depicted organizations to function as information-processing systems (Galbraith, 1977; Tushman & Nadler, 1978). To the extent that organizations exhibit characteristics of information processing, they should incorporate some sort of memory, although not necessarily resembling human memory. These theories, however, have not elaborated on the nature and function of any type of memory.

Even so, some researchers agree that information about the past can be stored in an organization (Douglas, 1986; Kantrow, 1987). Earlier theorists postulated that an organizational memory is embodied in standard operating procedures (March & Simon, 1958). Later theorists viewed organiza-

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tional memory in terms of structural artifacts (e.g., roles) that, over time, lose their efficacy and become obstacles to change (Starbuck & Hedberg, 1977). A number of theorists have attempted to list its contents (Argyris & Schon, 1978; Daft & Weick, 1984; El Sawy, Gomes, & Gonzalez, 1986; Hall, 1984; March & Olsen, 1976). For example, March and Olsen (1976: 62-63) believed that "past events, promises, goals, assumptions, and behaviors" are stored in memory, whereas Argyris and Schon (1978: 19) asserted that "learning agents' discoveries, inventions, and evaluations must be embedded in organizational memory." Hall (1984) posited that an organization's memory is comprised of cause maps, architecture, strategic orientations, and standard operating procedures.

Although it has generally been recognized that organizational memory consists of mental and structural artifacts that have consequential effects on performance, these concepts have remained fragmented, and have not been synthesized into a more coherent theory. Such a synthesis is the principal task of this article. Because the idea of organizational memory is bound to raise possible problems of anthropomorphism, we begin by exploring concepts that might overcome these problems. Following this discussion, we define organizational memory and propose that memory's retention facility can be structured in terms of five retention "bins." We discuss the processes of information acquisition, retention, and retrieval from memory in the context of these structural bins and then elaborate on how organizational memory can be used, misused, and abused in organizations. Some current organizational theories are reformulated in terms of the memory construct, and emphases and predictions are reassessed. The article closes with a look at a preliminary research agenda for the study of organizational memory.

## **ORGANIZATIONAL MEMORY AND THE PROBLEM OF ANTHROPOMORPHISM**

### **From Individual to Organizational Memory**

Memory is "the faculty of retaining and recalling things past" (*American Heritage Dictionary*, 1969), and it is associated primarily with individuals. A widely recognized belief is that the acquisition, retention, and retrieval of knowledge and experience from retention repositories (i.e., memory) influence subsequent individual behavior (Anderson, 1980). Through chemical and neurophysiological investigations and related studies in individual problem solving (Newell & Simon, 1972), researchers have gained some understanding of how information is acquired, coded into short-term and long-term memories, and evoked in various contexts. Even though these definitions pertain mainly to individuals, some researchers have suggested that memory can reside in supraindividual collectivities as well. For example, Loftus and Loftus (1976: 1) argued that memory functions "as some kind of repository in which facts (information) may be retained over some

period of time . . . memory is possessed not only by humans but by a great number of things as well."

The extension of these concepts to the organizational level, however, is fraught with ambiguity. Researchers disagree on the specific form of organizational memory and on what level it might reside in the organization. Opinions range from Argyris and Schon (1978: 11), who argued that organizational memory is only a metaphor (i.e., "organizations do not literally remember"), to Sandelands and Stablein (1987: 136), who raised the possibility that "organizations are mental entities capable of thought." Other opinions that fall some place between these rather divergent perspectives are unclear as to whether information is stored and processed by individuals who comprise the organization (Kiesler & Sproull, 1982; O'Reilly, 1983; Sims & Gioia, 1986; Ungson, Braunstein, & Hall, 1981), by the organization itself (Galbraith, 1977), or by the dominant coalition or upper echelon as a reflection of the organization (Hambrick & Mason, 1984).

### **Errors of Generalization**

One reason for the difficulty in defining organizational memory is that it is unclear whether or not information-processing ideas that are derived primarily from work on biological organisms can be extended to social and organizational phenomena—that is, the proposition that organizations have memories raises questions about anthropomorphism. This is not a new problem. Theories that depict organizations as having to learn (Fiol & Lyles, 1985; Starbuck & Hedberg, 1977) or give birth, reproduce, and die (Miles & Randolph, 1980; Pondy & Mitroff, 1979) have been criticized for such extensions (Pinder & Bourgeois, 1982).

Krippendorff (1975) identified two errors associated with this process of generalization. Errors of commission occur when irrelevant information is imposed on the target domain. For example, when groups and organizations are described as having life and death properties that are similar to biological organisms, errors of commission may occur (i.e., How useful is it to talk about the pain that accompanies an organization giving birth?). Errors of omission appear when the information that is transferred is selective and, thus, an important part of what it pertains to is omitted. In the preceding example, omission errors also may occur (i.e., Why consider memories as central libraries when memories are actually distributional and transient in character?).

To overcome possible errors of omission and commission, theorists simply have avoided homomorphic extensions (i.e., establishing that two entities are similar in form and share common properties) in favor of less stringent functional extensions (i.e., establishing that two entities merely assume similar functions). Organizations have been compared to military units (e.g., line and staff functions), life cycles (e.g., birth, growth, reproduction, and death), information systems (e.g., acquisition, processing, and retrieval of information), and language systems (e.g., surface and deep structures). In these contexts, for example, it is not assumed that organizations take on

the dispositional properties of birth, growth, reproduction, and death, but that akin to individual life cycles, organizations reveal similar patterns as they age. In doing so, the anthropomorphism problem is avoided.

Unfortunately, functional extensions also have the effect of merely re-labeling well-known phenomena. For example, it is hardly debatable that organizations resemble information-processing systems in terms of having sensors, memories, and central processors. Although such analogies and metaphors may clarify and extend our thinking about organizations, they do not resolve issues that deal with *construct validity* (i.e., How is organizational memory different from individual memory?), *measurement* (i.e., How do individuals, for example, retrieve information from organizational memory?), and *consequentiality* (i.e., Of what consequence is it for organizations that they are able to preserve knowledge of past events and bring it to bear on present decisions?). The goal of this paper is to address all three of these issues.

### **Working Assumptions**

Daft and Weick (1984) remind us that any approach to the study of organizations makes specific assumptions about the nature, the design, and the functions of organizations. Our discussion of organizational memory builds on three assumptions. The most basic assumption, already intimated, is that organizations functionally resemble information-processing systems that process information from the environment. As information-processing systems, organizations exhibit memory that is *similar in function* to the memory of individuals. Sensors act to receive information, information is processed with defined symbols in some processing capacity, and information is retrieved from memory. In both individual problem-solving and information-processing systems, sensors, processors, and memories are hypothesized to function in similar ways.

The second assumption extends the concept of organizations as information systems by also depicting them as interpretative systems (Burrell & Morgan, 1979; Daft & Weick, 1984; Weick, 1979a). Because interpretations about the environment vary considerably in terms of their uncertainty and complexity, organizations must develop processing mechanisms to scan, interpret, and diagnose environmental events (Duncan, 1972; Galbraith, 1977; Lawrence & Lorsch, 1967; Thompson, 1967). Varieties in organizational interpretational forms result from the differences in the ways managers form beliefs about their environments and the differences in their methods of intruding into these environments (Daft & Weick, 1984). This particular concept of organizations implies the existence and use of some form of memory.

The third assumption deals with the ontological basis of organizations that underlies Daft and Weick's (1984) concept of interpretation systems. For us an organization is a network of intersubjectively shared meanings that are sustained through the development and use of a common language and everyday social interactions (Burrell & Morgan, 1979). Taken in this context, *memory* is a concept that an observer invokes to explain a part of

a system or behavior that is not easily observed (Krippendorff, 1975), rather than a variable that is interrelated with other variables to produce particular outcomes. Organizational memories, therefore, are not variables with dispositional properties that have discrete causal effects on, say, structure and technology.

### **A Definition of Organizational Memory**

In general, an organization may exist independent of particular individuals, but it should be recognized that individuals acquire information in problem-solving and decision-making activities. This focus on individual cognitive activities as the central element in the organization's acquisition of information reflects an active construction of memory. However, interpretations of problems and solutions vary with individuals. The thread of coherence that characterizes organizational interpretations is made possible by the sharing of interpretations. Thus, through this process of sharing, the organizational interpretation system in part transcends the individual level. This is why an organization may preserve knowledge of the past even when key organizational members leave (Weick & Gilfillan, 1971). We will later argue that interpretations of the past can be embedded in systems and artifacts (e.g., structures, transformations, ecology), as well as within individuals. In this way, organizational memory is both an individual- and organizational-level construct.

Taken collectively, these arguments suggest several implications for a definition of organizational memory. The construct is composed of the structure of its retention facility, the information contained in it, the processes of information acquisition and retrieval, and its consequential effects. In its most basic sense, organizational memory refers to stored information from an organization's history that can be brought to bear on present decisions. This information is stored as a consequence of implementing decisions to which they refer, by individual recollections, and through shared interpretations. Following a formulation that we will develop later in the paper, information can be considered as decisional stimuli and responses that are preserved in particular storage bins and that have behavioral consequences when retrieved.

It is important to distinguish between decision information, which refers to cues perceived by individuals as reducing equivocality (Shannon & Weaver, 1949), and memory, which refers to stored information about a decision stimulus and response that, when retrieved, comes to bear on present decisions. This distinction is important because both information and memory can be mistakenly interchanged in the context of acquisition and retrieval. The difference between information and memory lies in their temporal qualities, as well as their uses in organizations.

This definition suggests three imperatives for considering organizational memory: (1) we need to more fully specify the locus of organizational memory (i.e., its retention structure); (2) we need to examine the processes by which information can be acquired, stored, and retrieved from this re-

tention structure; and (3) we need to investigate precise ways by which the use of memory is consequential to organizational outcomes and performance. The first two perspectives are developed in the next section; the third is developed as part of a discussion on the utility of organizational memory.

## DEFINING THE LOCUS OF ORGANIZATIONAL MEMORY

### Acquisition

Information about decisions made and problems solved forms the core of an organization's memory over time. We will consider both the nature of this information and recognize which aspects of a decision may be acquired. First, information about the particular stimulus event that triggered the decision-making process is typically retained by individuals in the organization. Kiesler and Sproull (1982: 550) would call this stimulus a "problem," whereas Weick (1979a: 130) would call it an "ecological change." In any event, the origin of a particular decision can be encoded. Second, the organization's response to this stimulus is also acquired. In effect, interpretations about organizational decisions and their subsequent consequences constitute an organization's memory.

The journalist's six questions (who, what, when, where, why, and how of the attributes of both a particular decision stimulus and response) provide a useful way of characterizing the scope of information that may be acquired about a particular decision stimulus and organizational response. It is important to note that the "why" of an organizational response can be known only when both the various properties of the stimulus and response are considered concurrently. All of the other information can be known discretely. This distinction provides the basis for our next argument that organizational memory is not centrally stored, but distributed across different retention facilities.

Such an argument is not to imply, however, that all information pertaining to a decision stimulus and response will be part of an organization's memory in each event. In some cases, the information itself may be so equivocal that it is almost unknowable (Weick, 1979a). As such, individuals typically create a cognitive heuristic to reduce the uncertainty and equivocality in the information environment they confront. Bartlett (1932: 21), for example, introduced the concept of the schema (which is grounded in the "reactions and experiences which occurred some time in the past") as this cognitive heuristic. After Miller (1956) documented the finite storage capacity of human memory, the study of the a priori structuring of information environments burgeoned (see Brewer & Nakamura, 1984; Taylor & Crocker, 1981, for reviews). Even at the organizational level of analysis, Ranson, Hinings, and Greenwood's (1980) *interpretive scheme* and Shrivastava and Schneider's (1984) *organizational frame of reference* have been argued to filter information that is considered within an organization. These individual- and organization-level schemata, interpretive schemes, and frames of reference may block, obscure, simplify, or misrepresent some of the at-

tributes of the decision stimuli and organizational responses. It is beyond the scope of this paper, however, to delineate precisely which aspects of a problem and its resolution will be filtered or encoded (see Jackson & Dutton, 1988; Kiesler & Sproull, 1982; Weick, 1979a; and the schematic information processing review papers identified above for an introduction to this topic). The point here is that it is theoretically possible for some, if not all, information relating to a decision stimulus and response to be part of an organization's memory. We will next consider where such information can be stored.

## **Retention**

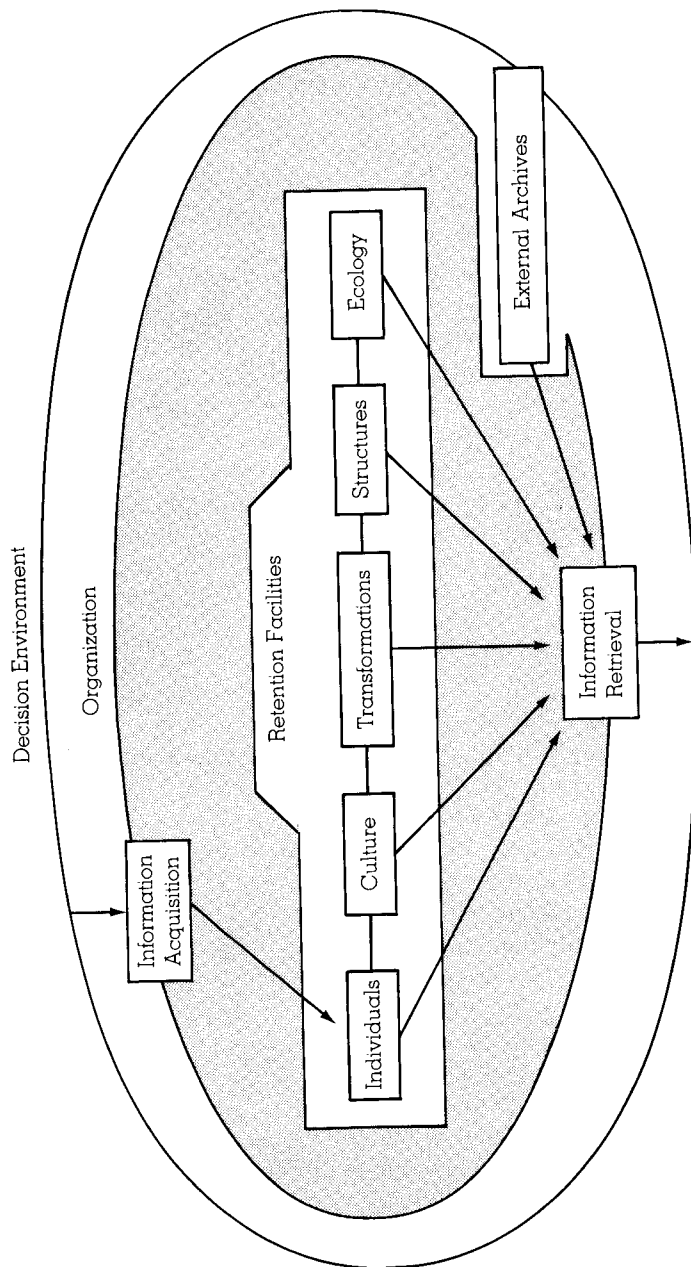
Decision information is thought to be stored in various physical locations (Simon, 1976); individuals (Argyris & Schon, 1978); accepted procedures (Cyert & March, 1963); and even standards of dress, protocol, and furniture arrangement (Smith & Steadman, 1981). Pondy and Mitroff (1979: 19) tried to simplify the discussion and argued that the storage facility is composed of "brains and paper." Borrowing the storage metaphor from individual-level memory processes (Cowan, 1988), we posit the existence of five storage bins or retention facilities that compose the structure of memory within organizations and one source outside of the organization (Figure 1). The argument has two fundamental elements: (1) patterns of retention vary according to how well decision stimuli and responses can be stored and (2) organizational memory is not stored in one location, but rather it may be distributed across different parts of an organization. After examining the nature of these facilities, we will discuss aspects of the decision information that most likely will be stored in each bin.

**Individuals.** Individuals have their own recollections of what has transpired in and about organizations. As Argyris and Schon (1978), Nystrom and Starbuck (1984), Sandelands and Stablein (1987), and others have recognized, individuals in an organization retain information based on their own direct experiences and observations. This information can be retained in their own memory stores (Cowan, 1988) or more subtly in their belief structures (Walsh, 1988; Walsh, Henderson, & Deighton, 1988), cause maps (Weick, 1979a), assumptions (Brief & Downey, 1983), values (Beyer, 1981), and articulated beliefs (Sproull, 1981). Briefly, individuals store their organization's memory in their own capacity to remember and articulate experience and in the cognitive orientations they employ to facilitate information processing. Moreover, individuals and organizations keep records and files as a memory aid. As Huber (1991), March and Olsen (1975), Simon (1976), Weick (1979a), and Yates (1990) observed, such information technologies help to constitute an organization's memory.

**Culture.** Organizational culture has been the subject of increasing interest (Allaire & Firsirotu, 1985; Smircich, 1983). It has been defined as a learned way of perceiving, thinking, and feeling about problems that is transmitted to members in the organization (Schein, 1984). The words *learned* and *transmitted* are central to this definition and our purpose. Culture embodies past experience that can be useful for dealing with the future.



**FIGURE 1**  
**The Structure of Organizational Memory**



It is, therefore, one of organizational memory's retention facilities. This learned cultural information is stored in language (Donellon, 1986), shared frameworks (Duncan & Weiss, 1979; Shrivastava & Schneider, 1984), symbols (Dandridge, 1983; Pfeffer, 1981a), stories (Martin, Feldman, Hatch, & Sitkin, 1983; Wilkins, 1983), sagas (Clark, 1972), and the grapevine (Davis, 1953). Because this information is transmitted over and over again, some of the detail and context of the various decisions are likely to be dropped or even altered to suit the telling. Just the same, the fact that this information is collectively retained in the transmission process (i.e., the sharing of interpretations) is an important aspect of the retention facility. Information, then, is housed in this supraindividual collectivity (Douglas, 1986; Halbwachs, 1950/1980).

**Transformations.** Information is embedded in the many transformations that occur in organizations. That is, the logic that guides the transformation of an input (whether it is a raw material, a new recruit, or an insurance claim) into an output (be it a finished product, a company veteran, or an insurance payment) is embodied in these transformations. Perrow (1979: 76), for example, argued that the analyzability of search behavior in the transformation process characterizes the nature of technology. This search behavior varies from analyzable (where there are known ways of solving a problem) to unanalyzable (where the residue of experience, judgment, knack, wisdom, and intuition directs problem solving). In either case, the retrieval of past information from past transformations guides current transformation processes. By way of summary, we would note that Weick's (1979a) discussion of the function of a standard operating procedure applies to all of the transformations that occur in organizations. He wrote, "A standard operating procedure is a schema that structures dealing with an environment. [It] is a frame of reference that constrains exploration and often unfolds like a self-fulfilling prophecy" (1979a: 156).

Transformations occur throughout the organization. Practices from the design of work itself (Taylor, 1923), to selection (Arvey, 1979) and socialization (Van Maanen & Schein, 1979), to budgeting (Wildavsky, 1979) and market planning (Cosse & Swan, 1983) inhabit transformations and build on past experience. Hedberg, Nystrom, and Starbuck (1976: 47) referred to these as "activity programs." Similarly, memory is preserved in a variety of procedures (Cyert & March, 1963), rules (March & Sevon, 1984), and formalized systems (Walsh & Dewar, 1987). As Jelinek (1979: 162) noted, "Administrative systems are the mechanisms for impounding and preserving knowledge."

**Structures.** Organizational structure must be considered in light of its implications for individual role behavior and its link with the environment. Individual roles provide a repository in which organizational information can be stored. As a sociological concept, roles involve the labeling of particular positions in society, based on societal expectations. For example, we expect particular behaviors from professors, lawyers, politicians, and law-enforcement officers. Merton (1968) noted that social interaction between

persons is conditioned by mutual expectations attendant to their particular roles. For example, when students interact with faculty members, they encode a particular set of behavior based on their expectations, and they incorporate this behavior into their actions. Similarly, faculty members follow a related encoding process when they interact with their students (Schank & Abelson, 1977).

Thus, the concept of role provides one link between individual and organizational memories. Weber (1968) postulated that individual enactments are guided by collectively recognized and publicly available rules. Taken altogether, these rules represent formal and informal codifications of "correct" behavior that is conditioned by consensual agreement among the participants. In Walsh and Dewar's (1987) terms, this reflects the coding and channeling functions of an organization's rules. It is in this context that Krippendorff (1975: 23) suggested (perhaps anthropomorphically) that "the combination of roles in interaction memorizes an interaction sequence and thus constitutes a social memory of super-individual information."

To the extent that social roles become patterned over time to depict task differentiation and control, we can extend our argument about individual roles to apply to organizational structure as well. Particular theorists of organizational design acknowledge this premise. Meyer and Rowan (1977) characterized structure as reflecting the institutionalized myths of society that are sustained and legitimized by members of an organization. And, indeed, according to Douglas (1986: 112) an organization's memory serves to legitimate the maintenance of these myths. Finally, information-processing theorists (Duncan, 1972; Galbraith, 1977; Tushman & Nadler, 1978) have hypothesized that structure reflects and stores information about the organization's perception of the environment.

**Ecology.** The actual physical structure or workplace ecology of an organization encodes and thus reveals a good deal of information about the organization. Sommer's (1969) classic work illustrated the behavioral bases of physical design. In particular, the physical setting often reflects the status hierarchy in an organization. As a consequence, the workplace ecology helps shape and reinforce behavior prescriptions within an organization. Indeed, Oldham and Rotchford (1983) found that employees' interpersonal experiences were affected by their organization's physical layout. Specifically, employees who worked in a densely populated, dark office reported receiving low performance feedback in a setting that is marked by high interpersonal conflict and few opportunities to develop friendships. Not surprisingly, visitors' responses to an organization and its occupants have been shown to vary according to the nature of interior office design (Campbell, 1979; Morrow & McElroy, 1981). The workplace ecology, therefore, retains information about an organization and its membership.

**External archives.** It is important to observe that the organization itself is not the sole repository of its past. Just as when an individual's memory fails, he or she can turn to others to help recall a particular event, an organization is surrounded by others who follow its actions. Although they

are not a part of an organization's memory per se, these other sources do house information that can be retrieved about the organization's past.

Basically, former employees retain a great deal of information about an organization. Regardless of whether these individuals resigned, were dismissed, or retired, they can retain a fairly accurate account of their former organization's history, especially the history that transpired during their tenure. Neustadt and May (1986: 241) referred to such sometimes invaluable people as "old hands."

A number of others in an organization's environment work to uncover and record its action and performance. Competitors often chronicle an organization's every move (Porter, 1980). The government requires all publicly held companies to record and report a good deal of information each year in their annual 10-K reports. Moreover, governmental regulatory bodies, agencies, task forces, and committees routinely compile data regarding a company's performance. Financial service firms also record an organization's activities to inform their own and others' investment decisions. Moreover, firms (e.g., Standard & Poor's Corporation) collect data on company performance and sell this information to interested parties (e.g., COMPUSTAT). The news media also follow organizations on a daily basis and record their observations in a variety of outlets. Finally, business historians will also chronicle an organization's past (Broehl, 1984).

**Properties of retained information.** Each of the five internal bins that comprise the retention facility of an organization's memory varies in its capacity to retain decision information. Table 1 summarizes these properties. We should note that only individuals by themselves or as a part of a social collectivity have the ability to retain information about the events that triggered a decision response, as well as information about the organization's response.

Two points should be made about the role played by individuals in the retention of information. First, only individuals have the cognitive capability to fully understand the "why" of a decision in the context of an organization's history (Wong & Weiner, 1981). An understanding of why comes from an analytical assessment of the relationship between a cause and an effect (or in our terms, a decision stimulus and an organizational response). Whether

**TABLE 1**  
**Properties of Decision Information Retained in Organizational Memory**

	<b>Who</b>	<b>What</b>	<b>When</b>	<b>Where</b>	<b>Why</b>	<b>How</b>
Individuals	S/R	S/R	S/R	S/R	S/R	S/R
Culture	S/R	S/R	S/R	S/R	S/R	S/R
Transformations	R	R	R	R		R
Structures	R	R				
Ecology				R		R

Note: S = Decision Stimulus

R = Organizational Response

they use this capability is another issue. We recognize that individuals' ambivalence about understanding cause-and-effect relationships (Bradley, 1978; Miller & Ross, 1975) suggests that the "why" in any decision is likely to distort and decay quickly. The "why" in a decision also will distort and decay as it is passed over time from person to person as a part of an organization's culture. As such, a culture may carry an interpretation of why a decision was made but this received wisdom from the past may or may not be accurate. This problem of inaccuracy is compounded by the fact that it is difficult if not impossible for a corporate culture to query itself in a way that might correct this problem.

Second, as an aggregation of individuals' shared beliefs, an organization's culture also reflects information about the who, what, when, where, and how of a decision stimulus and response. The idea that an aggregation of individuals can house such information has been considered in the social sciences for nearly a century. Early on, Durkheim (1895/1938: ivi) argued that there are "collective ways of acting or thinking [that] have a reality outside of the individuals who, at every moment of time, conform to it." Durkheim's student, Fleck (1938/1979: 38), developed this idea further and argued that "cognition is . . . not an individual process of any theoretical particular consciousness. Rather it is the result of a social activity, since the existing stock of knowledge exceeds the range available to any one individual." He argued that this stock of knowledge is housed in a "thought collective." Another of Durkheim's students, Halbwachs (1950/1980: 51), believed that "a man must often appeal to others' remembrances to evoke his own past." A group whose members help evoke those remembrances is said to have a "collective memory." Durkheim and his students were among the first in the social sciences to argue that groups of individuals can retain knowledge about issues in a way that transcends the cognitive facilities of any individual through the process of sharing. Contemporary scholars have conceptualized sharing in terms of a collective map (Axelrod, 1976), a hypermap (Bryant, 1983), an intersubjectivity (Eden, Jones, Sims, & Smithin, 1981), a collective memory (Schuman & Scott, 1989), a dominant logic (Prahalad & Bettis, 1986), and a negotiated belief structure (Walsh & Fahey, 1986). Consistent with all of such work, our point is that the retention of organizational memory is not just an individual-level phenomenon, but can apply to a supraindividual collectivity as well through a process of sharing.

Transformations, structures, and ecology, however, might not retain information about a decision stimulus but they inhabit an organization's response to such a stimulus. By definition, they embody the means to carry out an organization's objectives. Once established, transformational technologies establish recipes or formulas about what is to be done, how and when to do it, and where to do it, and they may also include implications for the skills and abilities required of a person to accomplish these tasks (i.e., who). Structures, defined as stable role definitions, are less precise about change, but can clarify who is to perform what tasks and duties. It is the transformation technology, however, that establishes the specific task re-

quirements (i.e., the who, what, when, where, and how of task accomplishment). Finally, by its role in the channeling of behavior in organizations, the workplace ecology generally undergirds the where and to a lesser extent the how of a particular transformation.

## Retrieval

Following work at the individual level of analysis, information processing that is based upon the retrieval of information from memory can vary along a continuum from automatic to controlled (Kahneman, 1973; Langer, 1983). Automatic retrieval covers cases whereby information about present decisions is drawn effortlessly and intuitively, partly as a function of the execution of some well-established or habitual sequences of action. At the organization level, one example of automatic retrieval occurs when present behaviors are based on previous practices and procedures that have been shared and encoded in transformations, role structures, culture, and workplace ecology. The theoretical antecedents of automatic retrieval in individuals are grounded in notions of limited attention (Posner, 1982), information-processing capacities (Miller, 1956), and the desire to reduce uncertainty and equivocality (Weick, 1979a). Indeed, individuals are hypothesized to employ heuristics and schemata (Abelson & Black, 1986; Nisbett & Ross, 1980) when solving problems. Schemata are formed from past experience to facilitate information processing in information-rich decision environments. As repositories of past experience, schemata not only facilitate information acquisition and encoding (Cohen, 1981), but they also facilitate retrieval (Anderson & Pichert, 1978; Cantor & Mischel, 1977). Discrepant information may be ignored, while gaps may be filled with historically relevant information. It is no wonder that schemata speed problem solving (Taylor, Crocker, & D'Agostino, 1978).

At an aggregate level of analysis (i.e., culture), supraindividual schemata have been argued to function in much the same way. Douglas (1986: 12) articulated how it is that all members of an organization are likely to automatically retrieve similar information from organizational memory. She argued that to establish legitimacy any institution must ground itself in nature and reason. It does so by "control[ling] the memory of its members; it causes them to forget experiences incompatible with its righteous image, and it brings to their minds events which sustain the view of nature that is complementary to itself." Douglas (1986: 92, 91) referred to this process as an "institutional grip" that serves to "squeeze each others' ideas into a common shape." It is in this same spirit that Weick (1979a: 225) asserted that "retained information is sacred in most organizations." Such information is dismissed and distorted at one's peril. From this perspective, retrieval is motivated both by influence strategies and the implementation of past decisions.

Information also may be retrieved in an effortful and controlled manner. The ease with which this can occur varies across the five retention facilities. Individuals may retrieve information purposefully and consciously by making an analogy to a past decision (Neustadt & May, 1986). Individ-

uals' recollections of experiences and decisions, once conceptualized by Halbwachs (1950/1980) as a *thought collective*, are constrained by the limits of their participation in the organization. Not only is there a greater coverage of past experiences in such a collective, but the individuals can prompt each other to help remember the past. In this sense, multiple and even conflicting individual memories enable a more comprehensive retrieval process. The work on autobiographical memory (Rubin, 1986) and, in particular, the work that examines the relationship between personal histories, life stage, and the ability to recall public events (Brown, Shevell, & Rips, 1986; Schuman & Scott, 1989) complements our understanding of these retrieval processes in individuals. Moreover, Ackerman and Malone's (1990) innovative ideas about growing an "answer garden" in an organization testify to the promise of information technology as a means to help retain and retrieve past experience in organizations. This work begins to answer Huber's (1990) call for the development of computer-based organizational memories. How decision makers choose to utilize this retrieved information is a matter that will be considered in the following section. The point here is that information about a past decision stimulus and response can be consciously retrieved, but only by an individual or a collection of individuals (with or without the aid of information technology).

For some firms, it is difficult, but not impossible, to consciously retrieve information from an organization's culture. It is difficult, in part, because organizational members do not always realize that their gossip, historical sagas, and stories constitute "data" and, in part, because it is very difficult to be a participant observer and maintain objectivity in the best of circumstances (Spradley, 1980). As a result, outside ethnographers might have to be employed by an organization to read its own culture.

The content of an organization's history that is retained in transformations, structures, and ecology is very difficult to decipher and not prone to effortful retrieval (March & Sevon, 1984). As we have discussed, the retrieval of information from these storage facilities may be largely automatic. The only way then to control the retrieval of decision information from them is to either dismantle or redesign the transformational technology, structure, or ecology. The controlled retrieval of decision information from these three sources is nearly impossible without changing the content of what is stored. A consideration of how controlled and automatic retrieval processes can be managed in organizations will be developed as propositions in the following section.

### **THE ROLE AND UTILITY OF ORGANIZATIONAL MEMORY**

Of what consequence is it to organizations that they are able to preserve knowledge of past events and bring it to bear on present decisions? Business history is filled with examples of companies chastised for not forgetting their past, while others have been urged to remember their past.

Starbuck and Hedberg (1977), for example, reviewed the problems the Facit Company faced in coping with the changing technology in the mechanical calculator industry. The company's near bankruptcy and subsequent take-over was attributed to Facit's top managers' inability to recognize the development of electronic calculators as a serious competitive threat. These managers' memory for their great successes in the mechanical market blinded them to the changes. Wilensky (1967), in contrast, reviewed the Ford Motor Company's experience with the Edsel failure. He attributed this failure, in part, to Ford's insensitivity to the increasing sales of foreign imports. Yates (1983) examined the Detroit auto makers' exact problem 25 years later and found little evidence of a lesson learned.

The role of organizational memory in the management of organizations seems to be unclear. In the following sections we will review the short history of work that has already been completed in this area, and then we will develop propositions about the use, misuse, and abuse of organizational memory in the management of organizations.

### **A Historical Perspective**

As the Facit and Detroit auto maker examples illustrated, most of the early references to organizational memory generally have been raised in the context of a discussion of organizational adaptation or learning. Although there has been some appreciation for the fact that organizational memory can blind you if examined and mock you if not retrieved, these early theorists did not share the same vision of the role of memory in learning. Some underscored memory's negative effect upon organizational learning (e.g., March, 1972; Nystrom & Starbuck, 1984), whereas others emphasized the positive aspects of memory (e.g., Duncan & Weiss, 1979; Schon, 1983). It can be shown that the two perspectives are not necessarily mutually exclusive.

**History is more or less bunk! . . . Henry Ford.** There has been a great deal of concern at the individual level of analysis about the biases (Larwood & Whitaker, 1977), world views (Starbuck & Hedberg, 1977), and blind spots (Murray, 1978) of executive decision makers. Belief structures develop according to experience in an information environment to give it form and meaning (Walsh, 1988). These belief structures, however, can blind decision makers to aspects of these environments and thereby can compromise their organization's effectiveness (Walsh & Fahey, 1986). This same concern exists at the organizational level of analysis. At the organizational level, Nystrom and Starbuck (1984: 53) wrote, "Encased learning produces blindness and rigidity that may breed full-blown crises." The recognition of these potentially harmful encased learnings led March (1972) to conclude that memory is an enemy of organizations, an enemy that can reinforce a single-loop learning style that maintains the status quo (Argyris & Schon, 1978). In this view, it is not surprising to learn that Albert Speer was secretly pleased that the allied bombers destroyed the German factories' filing systems with their air raids. By destroying the files, the Allies were destroying many of the



outmoded "traditions and procedures that had been the mainstays of those bureaucracies" (Weick, 1979b: 65).

In summary, those that worry about organizational memory's role in organizational learning are concerned that the information content of that memory will compromise organizational decision processes. They worry that a clear view of the past will obscure an accurate view of the present—that is, problem definition, alternative generation and evaluation, and decision choice can be constrained by what Kantrow (1987) called *corporate tradition*.

**Those who cannot remember the past are condemned to repeat it!—George Santayana.** There are theorists, however, who celebrate the role that organizational memory can play in organizing. Cyert and March (1963), for example, observed that programming facilitates organizational learning. Successful organizations embed their adaptation activities in standard operating procedures. Success facilitates programming; programming, in turn, often breeds more success (Starbuck, Greve, & Hedberg, 1978). Since routine activities are handled best by these standard procedures, transactional costs associated with search and experimentation are reduced. Accordingly, the organization becomes more efficient. Indeed, in their review of the formalization literature, Walsh and Dewar (1987) found that most empirical investigations of formalization focused on its role in enabling these kinds of efficiencies. By reducing transactional costs, organizational memory helps to implement decisions that have been made (or need not be made again). Moreover, Kantrow (1987: 147) argued that new decisions are less likely to be rejected if they are imbued with the tradition and legitimacy of the past. He wrote, "Change that works by recapturing something that was there in the past has many resources on which to draw and a whole network of support on which to rely." Wilkins and Bristow (1987: 227) articulated a similar argument; they advised executives to "learn to change by honoring the past."

In contrast to those who decry organizational memory's constraining role in the early stages of decision making, some theorists argue that memory can facilitate problem definition, alternative generation and evaluation, and choice. Neustadt and May (1986: 32), for example, argued that "better decision making involves drawing on history to frame sharper questions." Similarly, Hedberg, Nystrom, and Starbuck (1976: 41) reasoned that "foot-holds in time are the appropriate components for assembling trajectories into the future." Even March (1972), who argued that memory should be treated as an organization's enemy, acknowledged that "for most purposes, good memories make good choices." Duncan and Weiss (1979) agreed that the content of organizational memory does not always have to be seen as a constraint. Moreover, they believed that a facility must exist in an organization in order to store communicable, consensual, and integrated knowledge. This knowledge integrates and coordinates all organizational activities—even the transmission of new knowledge throughout the system. This facility, of course, is an organization's memory.

In summary, those who view organizational memory in a positive light do so for a number of reasons. While recognizing that a complete reliance upon the past can produce blinding encased learnings, they argue that a cautious appreciation for the past (reviewing the past decision's stimulus as well as the organizational response) can enhance the vision of a current decision situation. It is important to consider here our distinction between memory's retention structure and the content of the decision information stored in it. The structural facility is important for housing information, be it old or new. It is the content of this information that is sometimes decried for its role in hindering learning, not the storage facility itself. Finally, there is a belief that organizational memory can facilitate decision implementation. Beyond enhancing the ability to make a sound decision, memory helps to control and coordinate its implementation.

These distinctions between the structure of organizational memory and the nature of information stored in it and memory's role in both the formation and implementation of decisions are helpful when considering the ultimate utility of organizational memory in the management of organizations. The tension between the two historical perspectives rests on a fine distinction between a celebration of the efficiency born of automatic retrieval processes and the apprehension of not knowing if these efficiently produced routines and programs are out of step with the present circumstances. The resolution of this tension embodies the challenge in the use of organizational memory.

### **Use, Misuse, and Abuse of Organizational Memory**

Any discussion of the use, misuse, and abuse of organizational memory naturally involves a discussion of the active management of organizational memory by *individuals*. This is a tricky conceptual issue because the discussion implies the purposeful use of memory by individuals when, in fact, misuses and abuses of memory can occur as a result of automatic retrieval processes (especially from transformations, structures, and ecology) of which individuals may not be as conscious. Therefore, the following discussion will focus on how decision makers may purposely and consciously employ organizational memory while recognizing that automatic retrieval may occur at both the individual and supraindividual levels of analysis.

A consideration of organizational memory reveals that it plays three important roles within organizations. First, it plays an informational role. The information content that is housed in memory's retention facilities can contribute to efficient and effective decision making (particularly in the pre-choice decision stages). Second, organizational memory fulfills a control function. It can reduce the transaction costs that are often associated with the implementation of a new decision. The "whats" and "hows" that can be housed in many of the storage bins serve to efficiently shape desired behaviors without incurring expensive monitoring costs. Third, organizational memory can play a political role. Control of information creates a source of

dependence with which individuals or groups in power are able to influence the actions of others. The filtering of particular information from memory that supports a particular agenda can serve as a means to enhance and sustain power. Acknowledging these broad roles, we now develop a number of propositions that deal with how organizational memory is used, misused, or abused in organizational life.

**The use of organizational memory.** Neustadt and May (1986: 251) pointed out that decision makers must recognize that "the future has no place to come from but the past." It is incumbent upon decision makers, therefore, to understand how the past will shape their present decisions. Because the present is not wholly derived from the past, an effective decision maker must balance an appreciation of history with an assessment of the present to achieve particular ends. In such a case, the use of organizational memory can facilitate these decisional processes.

Specifically, the retrieval of both decision stimulus and response information from the individual retention facility and other sources of memory can help to frame a particular problem or opportunity in its historical context. By and large, it is the controlled (i.e., purposeful and conscious) retrieval of information from the retention facilities that can be the most help in the decision formulation stages, when a person is assessing the similarities and differences between the past and the present (Neustadt & May, 1986). In Weick's (1979a: 221) terms, they should "treat memory as a pest" and attempt to discredit or doubt this retrieved information in the context of the present decision; that is, decision makers should work to establish the predictive validity of the past. Because past decisions are not entirely predictive of the future, nor are they necessarily applicable to the present, this use of past information should be examined with care. The uncontested use of past decisions can enhance the likelihood that errors will occur. As such:

*Proposition 1: Decisions that are critically considered in terms of an organization's history as they bear on the present are likely to be more effective than those made in a historical vacuum.*

Once a decision has been made, decision makers turn their attention to its implementation within the organization (Janis & Mann, 1977). Overcoming resistance to change is one of the key tasks facing managers at this point (Kotter & Schlesinger, 1979). By communicating how the present decision (with its implications for the future) has its roots in the organization's collective experience, decision makers can imbue their choice with a sense of legitimacy that otherwise would be lost (Kantrow, 1987). This legitimacy can help foster a commitment to a chosen course of action, as opposed to a mere compliance with the new direction. This commitment not only enhances each individual's attachment to the organization (Reichers, 1985), it decreases monitoring and supervisory costs as well (Ray, 1986). As such:

*Proposition 2: Decision choices framed within the context of an organization's history are less likely to meet with resistance than those not so framed.*

Organizational memory holds a second implication for the management of decision implementation. The decision response information that is housed in each of the storage facilities has been shown to have a powerful influence in shaping behavior. As we pointed out, much of this information is retrieved automatically. We recognize that individuals with their "encased learnings" may obstruct a change effort. In this light, Starbuck and Hedberg (1977: 256) argued that "top management heads will have to roll" because they cannot be trusted to move beyond their past encased learnings. Additional justification for replacing top managers was offered by Starbuck, Greve, and Hedberg (1978: 133). They observed that these managers "overestimate the generality of their past decision rules and their past analytic techniques, so they underestimate the speed with which their expertise becomes obsolete." Cangelosi and Dill (1965: 199) would support the view that management succession is likely to yield profound changes if for no other reason than the egotism of top managers usually prompts them to disregard past precedent entirely. Only a portion of only one of organizational memory's retention facilities is replaced, however, when top managers are dismissed.

Change agents must recognize that encased learnings and responses are stored in the other retention facilities and that this information is subject to automatic retrieval. Information in these other retention facilities also must be unlearned. The best way to unlearn or forget these past memories is to promote what the cognitive psychologists call retroactive interference. This is the phenomenon of forgetting that occurs when new learning inhibits the recall of old learning. The cultural, transformational, structural, and ecological facilities then must be filled with new behavioral prescriptions (responses) consistent with the new intended direction. In this light, it is no surprise to discover that the performance implications of management succession are so equivocal (Walsh & Seward, 1990). Accordingly:

*Proposition 3: Change efforts that fail to consider the inertial force of automatic retrieval processes are more likely to fail than those that do.*

**The misuse of organizational memory.** Organizational memory can be misused in three contexts. First, the automatic retrieval of information may be allowed to shape a routine decision response when a nonroutine response is called for. Second, the controlled retrieval of information may contribute to a nonroutine response when a routine decision would have been appropriate. And third, a controlled retrieval process may be appropriately activated in an attempt to elicit a nonroutine response, but it may be employed poorly.

As the first proposition established, the critically evaluated controlled retrieval of information from organizational memory can enhance decision making. A problem arises when decision makers are unaware that the decision response information housed in their organization's memory is shaping behavior through an automatic retrieval process. In such a circum-

stance, the behavioral prescriptions that are encoded in organizational memory end up shaping a response to a situation when a more considered response may have been called for. Marcus (1988), for example, illustrated how rule-bound organizations have trouble responding innovatively to challenges. In this instance, the neglect of the powerful influence of organizational memory constitutes misuse. The decision consequences in this circumstance may be severe. Essentially, the decision makers commit a Type II error. They end up with a routine decision response when a non-routine response would be more appropriate. Accordingly:

*Proposition 4: The automatic retrieval of past decision information that fails to meet the requirements of more novel situations is likely to promote deleterious decision making.*

Perhaps a fear of committing the kind of Type II decision error identified above leads decision makers to commit a Type I error. Analogously, Kerr (1975) reasoned that physicians would much prefer to diagnose a well person as sick, rather than a sick person as well. In the management arena, decision makers may employ a controlled retrieval process to formulate a nonroutine decision response when a routine response based on an automatic retrieval process would suffice. In this instance, the costs to be borne are largely opportunity costs. The decision makers could have engaged other problems with their time and talents. As such:

*Proposition 5: In inertial situations that call for routine solutions, the critical consideration of purposefully retrieved past decision information consumes a manager's time and energy and, thus, creates wasteful opportunity costs.*

Many decision makers are well aware of the impact that the past has on the future. When confronted with a decision situation, they search for precedent. As such, they exhibit an effortful retrieval process and reason by analogy. Neustadt and May (1986), however, warned us of the limitations of such reasoning. In fact, they classified analogies according to the hold they have on our reasoning (i.e., irresistible, captivating, seductive, and familiar). Without stopping to consider the similarities and differences between the past and the present, decision makers can be blinded by past analogies. Ironically, such an awareness of history can promote a routine response to a situation, just when a nonroutine response is called for. In this instance, the decision makers appropriately engaged in a controlled retrieval process, but they did not critically evaluate the retrieved information. As such, they misused organizational memory. Indeed, Duhaime and Schwenk (1985) illustrated how reasoning by analogy may compromise an organization's acquisition and divestment strategy. Accordingly:

*Proposition 6: The controlled retrieval of decision information that is not examined in the context of novel situations is likely to promote deleterious decision making.*

**The abuse of organizational memory.** Weber (1968) argued that any

analysis of bureaucratic organizations must include how internal organization contributes to both efficiency and domination. Our discussion of the use of organizational memory was largely concerned with how it can promote efficiency; here we will consider how its abuse can promote domination in the extreme.

Perrow (1972: 16) observed that the "resources and goals of the organization are up for grabs, and people grab for them continually." The control function inherent in organizational memory marks it as a tempting tool that can be used by people when they grab for resources. Indeed, the management of information is useful for legitimating and consolidating power in organizations (Feldman & March, 1981). Information control creates a source of dependency with which individuals or groups in power are able to influence the actions of others (March & Simon, 1958; Pfeffer, 1981b). It follows then that individuals and groups can manage information to acquire power; once in power, they can selectively retain and retrieve information to consolidate it. By actively managing what information is acquired, retained, and retrieved, people in power can maintain, if not enhance, their standing in ways that correspond to their beliefs and ideology. Moreover, given that the decision stimulus information is lost as it is stored in the organization's transformations, structure, and ecology, retrieved information can be distorted and manipulated to serve self-aggrandizing ends. The point here is that retained decision information is not value free; its informational and control functions can serve either useful efficiency or abusive domination. As such:

*Proposition 7: The self-serving manipulation of organizational memory's acquisition, retention, and retrieval processes by an organization's members will enable their autocratic entrenchment and, thus, compromise the organization's sustained viability.*

## **REASSESSING THEORIES OF ORGANIZATIONS USING MEMORY**

We have advanced arguments for more specific representations of memory in our present theories. If such representations are indeed different from others, they should lead to different emphases, concepts, explanations, and even predictions in some areas of organizational theory. The hypothesized principles of the acquisition, retention, and retrieval of information in and out of organizational memory need to be assessed and then tied to other theories. We will elaborate on particular areas for which the concept of organizational memory may complement existing theories.

### **Individuals as Sources of Memory**

The most fundamental issues to be addressed in the study of information acquisition are, "What information is acquired by the organization, and why?" It should be recognized that one of the most important keys to un-

derstanding acquisition, retention, and retrieval processes is to understand the nature of the individuals that compose the organization. Individuals are important not only because they, themselves, are a source of retained information, but also because they largely determine what information will be acquired and then retrieved from the other memory stores (see Figure 1 and Table 1). As such, an examination of the nature of the individuals that compose the organization can offer initial insights about the construct validity of organizational memory.

The most important individual attribute that is relevant to the study of organizational memory may be length of service in the organization. As Pfeffer (1983) noted, an understanding of an organization's practices and beliefs comes with tenure in the organization. Long-tenured individuals can facilitate the retrieval of information from organizational memory. However, Morris (1973) and Pfeffer (1983) also pointed out that an internal labor market dominated by employees of long-standing tenure is not attractive to younger, ambitious individuals who may embody or may be receptive to new ideas. In such circumstances, the organization is poised to purposefully retrieve information from memory, but it may no longer acquire information effectively. Pfeffer (1983) concluded that an organization that is marked by an unbroken distribution of length of service in its employees (i.e., no distinct tenure-based cohorts) is likely to be most effective. The perspective developed here would add that the range of the distribution is important to consider as well. The absolute length of service in the tenure profile of the organization is critical to the effective retrieval of information. Simply put, the organization needs a continuous link to its "old timers" to ensure adequate organization memory acquisition and controlled retrieval processes.

### **The Impact of Environmental Change on Memory**

The principles of organizational memory are most in evidence when the organization's environment changes profoundly. Such a change might be thought to trigger change-based acquisition processes as well as possible retrieval processes. The study of an organization's responses to deregulation in an industry (Smith & Grimm, 1987) or to a technological discontinuity (Tushman & Anderson, 1986) might provide an opportunity to assess the various principles of memory or to explore some of their hypothesized ties to adaptation and change management. Smith and Grimm (1987), for example, investigated the relationship between strategic change and later firm performance following the deregulation of the railroad industry. According to these authors, firms that changed strategies outperformed firms that did not. It is quite possible that the effective use of organizational memory contributed to the successful strategic realignments.

To begin, we would predict that the companies who thrived following deregulation would be marked by a long-linked tenure profile; those that either failed or suffered performance problems would be managed by a demographically distinct cohort. Companies in the first instance would be more likely to attend to the full ramifications of the change (Starbuck et al.,

1978). Second, we would predict that the companies who successfully re-oriented their strategies would have managed organizational memory's retention and retrieval processes. Specifically, we would expect management turnover in the successful companies as some of their individual storage facilities are emptied of past recollections that, if uncritically or automatically retrieved, might impede the implementation of a new strategic direction. Similarly, attempts to control automatic retrieval processes by changing the corporate culture, transformations, structures, and ecology might be evidenced if the strategic change was "revolutionary" (Miller & Friesen, 1980). Finally, case studies across the successful and unsuccessful firms should demonstrate automatic and controlled retrieval differences. Consistent with Proposition 1, we predict that successful firms would have retrieved past instances of their company's responses to environmental shocks, evaluated their similarity or dissimilarity to deregulation, and then formulated a new strategy in this context. In keeping with Proposition 4, we expect that unsuccessful firms would not have considered past history thereby letting their automatic retrieval processes produce a routine response when a nonroutine response was appropriate. If these firms did consider the past, Proposition 6 would suggest that they reasoned uncritically by analogy to produce a response that was more consonant with the past than the present.

### **Memory as a Component in Organizational Design**

An understanding of organizational memory may provide tools for enhancing our theories of organizational design. We argued previously that information-processing theories of organizational design (Galbraith, 1977; Lawrence & Lorsch, 1967; Thompson, 1967) have not been explicit in specifying the function of organizational memory, if any, in designing organizations. Two reasons might account for this omission.

First, it may have been assumed that memory is adequately reflected in organizational structure. Because organizational structure is typically represented as a product of historical forces and managerial choices (i.e., stable relationships between jobs over time), the tendency is to systematically trace changes in organizational structure over time and to assume that the decision information content of memory is reflected in such changes. Even though organizational memory is reflected a bit in organizational structure, we argue that it is not an isomorphic representation. Organizational memory includes other artifacts (i.e., ecology, transformations, etc.) that build on the historical interactions among members of the organization.

A second and related reason, initially suggested by Krippendorff (1975), is that many theories tend to deemphasize temporal interrelationships. Even when time is a key variable, the tendency is to emphasize formative changes in organizational structure (e.g., shifts from functional to multidivisional to matrix structures) in contrast to addressing changes in the firm's constitutive character (e.g., shifts in the meaning of organizational structure



as constructed within the relevant contextual system). The restrictive focus on organizational structure as a product of historical forces or as a result of contemporaneous social interactions between organizational members precludes an active synthesis of organizational memory and organizational design.

One such application would be the management of clans (Ouchi, 1980) and networks (Miles & Snow, 1986). A *clan* is a specific governance structure that arises because of bureaucratic failure under conditions of high performance ambiguity. Conceivably, clans operate on the basis of trust and are regarded as having lower transactional costs due to sophisticated socialization (Ouchi, 1980). But what makes the organizing costs associated with clans lower than those of bureaucracies or markets? Wilkins and Ouchi (1983) have argued that all parties in any transaction have to view exchanges as equitable. This demand for equity leads to transaction costs, particularly when the value of goods and services is difficult to establish. Accordingly, the problem faced by organizations is this: How can a perception of equity be achieved among self-interested parties who are bounded-rational?

Unlike markets and bureaucracies, clans face more ambiguity in determining a fair and equitable transaction. Wilkins and Ouchi (1983) postulated that clan members have to believe that they will be dealt with equitably in the long run, particularly when present exchanges appear inequitable to them. In this context, we argue that a necessary condition for making this possible is the presence of organizational memory. Two premises are important here: (1) that the organization has the capability of recording decisions and (2) that the organization has the capacity to activate past decisions in present decision-making processes.

The management of memory also bears strongly on a new and emerging organizational form: the network. A *network* can be defined as a purposeful and conscious relationship between and among distinct organizations (Jarillo, 1988; Miles & Snow, 1986). Networks usually evolve to reduce external transactions, achieve economies of scale and scope, and facilitate the sharing of information (Park, 1990). Similar to clans, networks depend on truth (i.e., "fair sharing mechanisms" among members to sustain their viability and to discourage opportunistic behavior among them). In addition to any formal agreements that may bind them (e.g., joint ventures, strategic alliances), members of the network rely on trustworthy transactions (sustained by memory) to preserve and stabilize network relationships.

If a person accepts the possibility that past decisions are brought to bear on present events, then the person must postulate the existence of an organizational memory that enables the coexistence of the past and present. We argue that there are organizational consequences for managers who recognize the existence of memory and who manage it actively, as opposed to those who do not. As a design issue, the recognition of organizational memory entails understanding how past events are acquired, retained, retrieved, and even forgotten within the organization.

## TOWARD A METHODOLOGY FOR STUDYING ORGANIZATIONAL MEMORY

The foregoing discussion of organizational memory suggests a general research agenda. Although the concept of memory makes much intuitive sense, particularly when used metaphorically to extend present concepts of organizations, it defies precise measurement and assessment. Even though issues about measurement and assessment are important, it is relevant to first delineate research phases in which a direct measurement approach may or may not be appropriate. Consistent with our concept of organizational memory, we argue that three research phases are necessary: (1) confirming the structure of organizational memory; (2) parsing the acquisition, retention, and retrieval processes into meaningful steps; and (3) assessing the consequentiality of memory for organizational performance. As Table 2 indicates, each phase can be viewed as a distinct step with its own methodological and analytic imperatives.

### Phase 1: Assessing the Structure of Organizational Memory

The key epistemological question in this phase is conceptual: Does the concept of organizational memory have construct validity? We hypothesized that the structure of organizational memory is composed of a number of storage bins: individuals, culture, transformations, structures, ecology, and external archives. Underlying our hypothesis is a premise that memory is *distributional* in nature; that is, the repository of organizational information is not confined to one central location (as is the case of the brain in the individual body), but, rather, it is distributed throughout the entire organization (as might be the case of memory within the human brain). Within this conceptual definition, any attempt to directly measure or assess organizational memory is doomed to be partial and incomplete, unless one rigorously examines all the bins. Of course, this is a daunting task.

As such, we suggest that the appropriate strategy for examining memory in this context is not through verification or direct measurement, but rather by falsification (Bacharach, 1989). In his attempt to challenge inductive approaches to theory building, Popper (1959) argued that good theories result from a legitimate attempt to prove them wrong (i.e., falsify), rather than by an attempt to confirm them. This approach may be particularly meaningful when examining organizational memory. Its distributional nature suggests that most attempts to confirm the existence of memory are bound to be incomplete. The attempt to disconfirm the existence of decision information in each of these bins, for example, appears to be a better research strategy. Methods for falsifying theories entail specifying boundary conditions that are most likely to establish memory and testing the hypothesized effects against competing theories. This latter approach is discussed in more detail in the section on Phase 3.

### Phase 2: Parsing the Process

In contrast to the first conceptual phase, the key epistemological question here is empirical: Can we obtain adequate measures of our concepts?

**TABLE 2**  
**Research Issues in the Study of Organizational Memory**

<b>Conceptions of Organizational Memory</b>	<b>Conceptual Premises</b>	<b>Epistemological Questions</b>	<b>Suggested Research Strategies</b>
<b>Phase 1—Assessing the structure of organizational memory</b>	Distributional: Arrayed in five bins: individuals, culture, transformations, structures, and ecology.	Conceptual: Does the concept of organizational memory have construct validity?	Test through falsification: inference about memory based on boundary conditions.  Precedent: Transactional cost (no direct measures applied, but existence inferred from high information impactedness and asset specificity).
<b>Phase 2—Parsing the information acquisition, retention, and retrieval processes</b>	A focus on the properties of decision information, as well as the automatic and controlled retrieval processes.	Empirical: Can reliable and valid measures of the constructs be obtained?	Test through process verification: oral history methodologies and retrospective analysis, mapping parameters of memory, charting flows of action, identifying episodic scripts and stimulation.  Methods: Protocol analysis; institutional mapping techniques.
<b>Phase 3—Assessing the consequences of organizational memory</b>	Contexts in which organizational memory is used, misused, and abused, particularly in organizing/design issues.	Analytical: What research measures will illuminate the hypothesized effects of organizational memory?	Test through statistical verification: counterposing of hypothesized effects versus predictions of rival theories.  Precedent: Institutional theory (counterpositioning of two or more theories).

Because the acquisition, retention, and retrieval of memory is an ongoing process, it is difficult to pinpoint exact boundaries between these processes. Even so, researchers must decide how to parse the process into ecologically meaningful stages that are subject to verification and measurement.

Previously we suggested that individuals are an excellent starting point for examining information acquisition, retention, and retrieval processes. A number of research methods are available to obtain such information. People can query themselves or others about past recollections. This

can be on an ad hoc basis or through systematic oral histories (Vansina, 1985). In fact, Schuman and Scott (1989) used this very approach in their study of the collective memories of various generations of Americans. Individual beliefs, values, and assumptions are more difficult to uncover. The researchers can either ask the person to try to supply them or the theorist can use a variety of techniques which will reveal these beliefs (Bougon, Weick, & Binkhorst, 1977), values or goal orientations (Bourgeois, 1985), and assumptions (Mason & Mitroff, 1981). Individual recollection can also be aided by a reliance upon the organization's files and archives. With the passage of time, however, their sheer volume presents a daunting task of interpretation, as does an inability to recall the particular context of the various decisions. At that point, the in-house historian can become a helpful guide to the past (Smith & Steadman, 1981).

At the retention stage, we need to address issues of encoding. Specifically, we need to understand where information of various kinds is stored. The journalist's questions were invoked at the beginning of this article in an attempt to explicate how the content of retained information is likely to vary across the different retention facilities. These ideas need to be assessed. Moreover, we need to understand how retained information is affected by the passage of time. Does this information decay in some predictable fashion? How do retroactive interference processes affect the nature of the information that is being supplanted?

Finally, the retrieval and use of information from organizational memory await examination. What kinds of events or circumstances trigger the controlled search for information from memory? Moreover, how do various organizational attributes moderate the response to such triggering stimuli? With respect to use, what factors prompt decision makers to engage in effortful retrieval and interpretation processes (i.e., examining similarities and differences between the past and present), as opposed to employing a more automatic process wherein their reasoning is guided only by unexamined past analogies?

Even though there are many ways to record this information, we prefer process methods of verification that are similar to those used when attempting to chart an organization's institutions (Barley & Tolbert, 1988). Process methods include mapping the parameters of organizational memory, charting flows of actions, and identifying episodic scripts of information retention. Mapping the parameters of memory involves identifying characteristics of retention in each of the five bins. Because researchers ultimately will attempt to link these parameters with use, assembling longitudinal indicators is of crucial importance—a process that eventually should examine "why" information is stored in particular bins. Charting flows of action results in a compilation of a detailed history of retention activity among the various bins. When a sufficient history is compiled, researchers might identify recurring patterns from which they can induce scripts or episodes that characterize the retention and retrieval process. Therefore, we can begin to better understand why particular aspects of decision information are stored

in the various bins. Understanding the purpose behind each script would provide the first step in understanding the process by which information becomes stored in various social and organizational contexts.

The archival study of organizational demography coupled with case studies of organizational memory management practices in companies dealing with naturally occurring shocks represents but one approach to the study of organizational memory. It might also be possible to employ some organizational experimentation techniques. Salancik's (1979) ideas about the utility of organizational stimulation have yet to be explored. It is quite possible to imagine a study of encoding and retrieval processes whereby organizations could be "stimulated" with varying types of shocks. Subsequently, the firm could be queried about its recollections of these stimulations. Such a study could provide insight on organizational attention processes, as well as on how the new information is encoded; that is, it would not be difficult to assess attributes of how the "sent" stimulation varied from attributes of the "received" recollections as a function of both the nature of the stimulation and the organization's demographic profile.

### **Phase 3: Assessing the Consequences of Organizational Memory**

The key epistemological question in this final phase is analytic: What research methods are appropriate for examining the hypothesized costs and benefits of memory in organizations? The problem here is compounded by the fact that a researcher may not be able to measure organizational memory at any one time (see Phase 1), thus precluding the use of logical deduction and hypothesis testing.

We recommend a research strategy that counterposes the predictions of organizational memory with the predictions of one or more competing theories. In such cases, it is important to specify the boundary conditions that develop, sustain, and activate organizational memory. Earlier, we suggested that there could be a long and stable history of tenured individuals, a standing tradition of cohort groups, and low turnover. We posit that such organizations will have a higher capacity to acquire, retain, and retrieve decision information relative to other organizations.

The above method has been used in a similar fashion to study the effects of organizations having high transactional costs (Wilkins & Ouchi, 1983). Similar to the organizational memory construct, transactional costs tend to be distributional and difficult to measure. Accordingly, researchers introduced boundary conditions that lead to high transactional costs (e.g., high asset specificity and bounded rationality) and then examined their hypothesized effects on governance structures. The same research strategy should be useful here.

## **CONCLUSIONS**

Despite the general use of the term *organizational memory*, it is not clear that we have understood the concept or its implications for the man-

agement of organizations. To date, a myriad of unexamined conjectures has defined a concept that has even served as a basis for prescriptive management advice. This article examined the historical treatment of the concept, refined it, and defined it as a theoretical construct. Moreover, we discussed its role in organizing, and shaped an appreciation for the methodological challenges awaiting future researchers in this area. In so doing, we detailed the structure, content, and process attributes of organizational memory. Our goal has been to stir research interest on an important but often overlooked construct in the organizational sciences.

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