Transactive Autobiographical Memory and Organizational Routines

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ABSTRACT
I develop a conceptual model of the micro-foundations of routines that incorporates autobiographical memories, defined as the memories people have of their own lives. I argue that individuals’ autobiographical memories are transformed into collective declarative memory via transactive memory processes, and that the resulting memory systems play a significant role in the development, adaptation and enactment of routines, and especially those routines that draw on shared narratives of identity and sense-making, culture and social bonding, collective goal-setting and problem solving. I also discuss the model’s implications for research and practice.

INTRODUCTION
The recurrent action patterns associated with organizational routines are stored as procedural memory (Cohen & Bacdayan, 1994). At the same time, routines also involve the storage and retrieval of knowledge as declarative memory (Lazaric & Denis, 2005). Both forms of memory interact in the enactment of routines. Action patterns stored as procedural memory trigger the retrieval and deployment of stored knowledge, while such knowledge stored as declarative memory guides and informs patterns of recurrent action. As a result, routines may result in the acquisition of new knowledge and adapt in response to organizational learning (Feldman & Pentland, 2003). At the micro-foundational level, these patterns of interaction and learning imply systems of transactive memory, defined as the process whereby groups of individuals share collaborative memories (Argote, 1999).

My theoretical paper focuses on a novel species of declarative transactive memory, namely transactive autobiographical memory, and its role in routines. In summary, I argue that within organizations, individuals’ autobiographical memories (defined as the memories people have of their own lives) are transformed into organizational memory via transactive memory processes. I further argue that the resulting collective autobiographical memories play a deep and
significant role in the development, enactment and adaptation of routines. As I will explain, this argument is novel and somewhat counter-intuitive, because autobiographical memory is rarely viewed from an organizational and transactive perspective (Wang, 2008).

In developing my argument, I draw on advances in the psychology of autobiographical and organizational memory. In particular, I rely on the finding that autobiographical memories are socially co-created and play an important role in the adoption of shared cultural values and norms, patterns of social bonding, conceptions of identity and agency, and help to define collective motivations and goals (Bluck, 2003; Pasupathi, 2001). Notably, these are important features of organizational life as well, and critical to the functioning of routines. Indeed, organizational routines are developed, adapted and deployed in relation to cultural values, norms of identity, and in response to collective motivations and goals (Lazaric et al., 2005). Thus, prior studies provide evidence to support my contention that transactive autobiographical memory systems are encoded into declarative organizational memory and have a significant impact on the micro-foundations of routines.

The remainder of my paper proceeds as follows. I first review the literature on organizational routines, autobiographical memory and transactive memory. I then explain how transactive autobiographical memory systems emerge within organizations, become part of the organizations declarative memory store and contribute to the micro-foundations of routines. I then discuss the implications of my model for future research into organizational routines, and especially those routines relating to organizational memory and identity, culture and social bonding, collective motivation and goal-setting. Finally, I summarize options for future empirics and potential practical implications.
BACKGROUND

Routines embody the recurrent action patterns that characterize social organization (Becker, 2005a). In fact, the emergence and continued existence of an organization depends on its development and effective performance of routines (Cohen et al., 1996; March & Simon, 1993). Organizational learning also entails routines in the search for information, acquisition of knowledge and the extension of collective know-how (Levitt & March, 1988). While the adaptive potential of routines underpins much organizational change, as new recurrent action patterns embody altered processes and behaviors (Feldman et al., 2003). In similar fashion, flexible routines enable dynamic capabilities of learning and strategic action within firms (Zollo & Winter, 2002). For all these reasons, it is important to explain the origins of organizational routines. Yet this process remains poorly understood (Becker, 2004).

The Origins of Routines

Some researchers define routines in terms of repeated sequences of actions (Cohen et al., 1994). Others define routines through analysing the content, processes and sequence of actions involved in the performance of routines (Pentland & Rueter, 1994). Feldman and Pentland (2003: 96) define a routine as “a repetitive, recognizable pattern of interdependent actions, involving multiple actors.” In each case, routines are viewed as fundamental components of organizations including firms (Cyert & March, 1992; March et al., 1993). As Nelson and Winter (1982) argue, routines are the source of behavioral continuity within organizations. Recent scholarship also stresses the dynamic features of routines, and the ability of routines to change in response to individual and collective experience (Pentland & Feldman, 2005). A comprehensive review of this literature is provided by Becker (2004) who states the definition employed in this paper: routines are here defined as repeated action patterns in organizational contexts.
Thus defined, routines occupy a central place in organizational theory. Indeed, some argue that routines are foundational components of all organizational forms including firms (Cohen et al., 1996). Routines embody central features of what social organizations consist in, namely organized systems of recurrent human behaviour. March and Simon (1993) therefore argue that routines are central to the behavioral theory of the firm. In the same vein, Nelson and Winter (1982: 400) locate routines at the heart of their evolutionary theory of economic change, writing that “routines in general play the role of genes in our evolutionary theory.” Recent scholarship extends these arguments and conceives of routines as the fundamental unit of selection in organizational evolution (Becker, Lazaric, Nelson, & Winter, 2005). From this perspective, the variation of routines is viewed as the social analogue of genetic mutation in biological evolution. Hodgson and Knudsen (2004) therefore describe routines as the fundamental replicators of organizational evolution. The firm is viewed as the organized embodiment of a system of routines, just as a living organism is the organized embodiment of a genetic system. In other words, firms function as the evolutionary interactors of organizational routines, akin to the role of living organisms as interactors of genetic inheritance.

Given the importance of routines, scholars rightly seek to understand how routines originate. Many focus their efforts on antecedent sociological or social psychological factors, such as the formation of power networks, group identification and sense making, collective goal pursuit and decision making, work coordination, and information sharing and collaborative learning (Becker, 2004). However, despite these numerous proposals, there is no consensus regarding the origins of routines conceived as recurrent action patterns. Moreover, despite the fact that routines result from and lead to individual action as behaviour, there are very few studies that explore the role of individual-level psychological factors in the origins of routines.
In addition, consensus is still emerging about the component features of routines. For example, Feldman and Pentland (2003) distinguish the ostensive from performative aspects of routines. The ostensive aspect embodies what we typically think of as the structure of a routine. While the performative aspect embodies the specific actions, by specific people, at specific times and places that enact routines. Previous research often conflates these two distinct features of routines (Becker, 2005a). Achieving such clarity is a crucial contribution towards explaining the origins of routines. In particular, the emergence of the ostensive aspects of routines may rely significantly on initial patterns of performance. Hence it is important to clearly distinguish between these different aspects of routines when seeking to model their origins.

In seeking to progress research in this area, scholars of organizations explore the processes of group learning and memory that influence the origination of routines (Becker, 2005b; Cohen et al., 1994). Others explore the origins of routines in relation to collective cognition and decision making (Augier & Sarasvathy, 2004), production systems (Adler, 1990) and the evolution of grammars of action (Pentland et al., 1994). However, puzzles remain at both the ontological and epistemological levels (Becker, 2005a). Regarding ontological commitments, scholars ask how attributes of individual personality and mind can be translated into routines as social and organizational phenomena. Equally puzzling are the epistemological processes whereby individual learning and knowledge become embedded in organizational memory and routines.

Similar questions bedevil the theory of the firm, given that firms are a major class of organizations. Routines capture many of the fundamental features of the firm, especially its capabilities defined as recurrent patterns of action (Winter, 2006; Zollo et al., 2002). Indeed, when viewed from behavioral and evolutionary perspectives, firms can be largely conceived as
bundles of routines (Nelson et al., 1982). Hence, scholars seek to understand the role of routines in the initial emergence of firms, as well as firm-level processes of learning and change (e.g., Barnett & Sorenson, 2002; Kaplan & Henderson, 2005). Endogenous factors requiring attention in this regard include attributes of the firm’s team structure, its entrepreneurial characteristics, memory store, production techniques and decision making practices (Becker, Knudsen, & March, 2006; Schumpeter, 2005). While exogenous factors influencing the firm’s routines include its relational networks, external sources of new information and market context (Stuart, 1998). Yet, scholars still puzzle over the micro-foundational processes by which routines and firm-level capabilities come into being (Gavetti, 2005). In this paper, I examine the potential role of transactive autobiographical memory in these processes.

**Autobiographical Memory**

Autobiographical memory is fundamental for the human self, its emotions and the experience of selfhood over time. Recent years have seen significant progress in understanding these functions of autobiographical memory, based upon innovative research in numerous areas of psychology, including cognitive, social, developmental, clinical and neuropsychology (Conway, 2005). As a consequence of this research, we now understand that autobiographical memory has three major areas of influence on human functioning: social, self and directive (Bluck, Alea, Habermas, & Rubin, 2005). Regarding social effects, the sharing of autobiographical memories underpins social bonding, the forging of meaningful relationships and the consistency of cultural norms (Conway & Pleydell-Pearce, 2000). Concerning the self, autobiographical memory underpins a concept of identity by providing a sense of personal coherence and psychodynamic continuity over time. While regarding its directive influence, autobiographical memory underpins sense-making about the experience of self and others
through time, thereby guiding present and future behavior, motivation, goal setting and problem solving. Importantly, the same organizational phenomena–identity, memory, behavioral norms, collective motivations, goal setting and problem solving–are critical to the explanation of routines (Feldman et al., 2003; Felin & Foss, 2009).

Among major contributions to this research is the Self-Memory-System (SMS) proposed by Conway and Pleydell-Pearce (2000). The SMS framework emphasizes the interconnectedness of self and memory and draws on a social-cognitive perspective of human personality. Autobiographical memory is depicted as the database of the self, conceived as a complex set of active goals and associated self-images. Within the SMS, autobiographical knowledge constrains what the self currently is, has been in the past, and can be in the future. The SMS framework also integrates the self with its autobiographical knowledge base which consists of three levels of autobiographical knowledge, arranged hierarchically: life story schema, lifetime periods, and general events (Conway, Singer, & Tagini, 2004). Figure 1 depicts the autobiographical knowledge base within the SMS framework, as a nested system of life story schemas, lifetime periods and general event memories.

The most fundamental level of the autobiographical knowledge base is the life story schema, defined as the overall framework for a total life narrative (Bluck & Habermas, 2000). For example, being a professor or an entrepreneur are both typical life story schemas. Life story schemas include generalizations about life periods and themes, as well as relations to cultural myths and typical narrative structures (McAdams, 2006; Singer, 1995). By thus linking events through time, life story schemas allow individuals to attribute meaning and causality to events,
conceive future goals and experience goal achievement. Importantly, possessing a culturally meaningful life story schema allows an individual to make sense of his or her life within society, to prioritize autobiographical memories, and to craft a meaningful narrative across the life span (Conway et al., 2004; Ibarra & Barbulescu, 2010). As the deepest layer of autobiographical memory, life story schema are relatively stable across long periods of life (Bluck et al., 2000).

These effects are especially important within cultures where the social expression of selfhood calls for an individual life story that is sensible and acceptable to others. This is often the case within contemporary societies where personal identities are less inherited and more constructed. In contemporary societies, that is, people must compose a self-narrative that has unity and purpose while at the same time incorporating dynamism, diversity and historical discontinuity (McAdams, 2006). For example, an entrepreneurial life story schema supports such a narrative. It conceives of a normative life story in terms of exploratory learning, seeking new challenges, creating value, embracing risk and uncertainty, and setting independent life goals (Downing, 2005; Rae & Carswell, 2000; Thornton, 1999). In fact, as societies embrace industrial modernity, they also tend to endorse the entrepreneurial life story schema (McAdams, 2006; Thornton, 1999). This trend is apparent in rapidly developing societies, where the entrepreneurial life story schema often reflects a struggle between traditional and contemporary life narratives (Inglehart & Baker, 2000).

The second level of the autobiographical knowledge base is the lifetime period, which consists of large sections of an overall life narrative. Lifetime periods underpin overarching life goals and activities, for example, attending graduate school or founding a new business. The third level of the autobiographical knowledge base is the general event, which consists of events linked across shorter time periods (e.g., a day or week) or organized by a shared theme (e.g.,
regular business meetings, attending educational courses). Together, life story schemas, lifetime periods and general events complete the autobiographical knowledge base depicted in Figure 1. Experience at the level of the working self then triggers retrieval from the autobiographical knowledge base, usually beginning at the level of general events which intersect with lifetime periods and the life story schema. Such retrieval processes stimulate a goal-based framework which guides search through the memory system. As a result, elements of the autobiographical knowledge base are synthesized with episodic memory and autobiographical memories enter awareness (Conway et al., 2004). Importantly, research also shows that aspects of this process are social and collaborative—people co-create autobiographical memories (Nelson, 2003). This implies that autobiographical memories may be subject to transactive memory, defined as the process whereby a person can access information stored in another person's memory, by knowing that the other person is a location for that information.

**Transactive Memory**

Transactive memory was first introduced in a series of seminal papers by Wegner and his colleagues (Wegner, 1987, 1995; Wegner, Giuliano, & Hertel, 1985). There are two broad categories of transactive memory that Wegner (1987) defines as differentiated and integrative. Differentiated transactive memory occurs when *different* items of information are stored in different individual memory stores, but the individuals know the general labels and locations of the items they do not hold personally. For example, a group of people may allocate one member of the group to remember specific details about a meeting, and the other members of the group can later refer to that person when they need to recall the relevant information. In contrast, integrative transactive memory occurs when the *same* items of information are held in different individual memory stores, and individuals’ memories thus overlap because they share label and
location information. For example, all members of a group agree to remember the same details about the outcome of a meeting and can later depend on each other to recall the same memory. It is important to note that both the differentiated and integrative forms of memory are necessary for a fully functional transactive memory system (Wegner, 1987).

From an organizational perspective, differentiated transactive memory occurs when members or the organization share a set of memory labels and locations, but may otherwise differ significantly in their domains of memory storage. These processes allow people to depend on each other for the enhancement of their personal memory stores, leading to the distribution of cognitive load and efficiency gains (Wegner, 1987). Whereas, integrative transactive memory represents the opposite situation: members of the organization have duplicate knowledge, for example, about an organizational lifetime period or procedural routine. Integrative transactive memory thus enables the organization and coordination of differentiated memories. This process is especially important in groups as a source of social bonding and relatedness (London, Polzer, & Omoregie, 2005). Importantly, these processes can extend to whole organizations and societies, making transactive memory “into a synonym for culture” (Wegner et al., 1985: 257).

Indeed, Wegner (1987: 197) argues that integrative transactive memory “affirms the need to have a group in the first place, showing all members the utility of coming together to remember.” Integrative transactive memory also plays a critical role in group learning and knowledge creation, as new information from different locations in the transactive memory system is tied together by common labels, and thus integrated into a common memory store (Argote, 1999). In well-developed transactive systems, there is a strong trend towards such integration. These systems then exert control over what is to be encoded, stored and retrieved,
and place a premium on integrative transactions (Meyer, Bartunek, & Lacey, 2002). Via these systems, teams and whole organizations allocate, store and retrieve common memories.

However, despite the importance of integrative transactive memory for culture and social bonding, group learning and the generation of new knowledge, most empirical studies focus on the differentiated aspects of transactive memory within organizations. In fact, some scholars discuss transactive memory exclusively in terms of differentiated processes (e.g., Huber & Lewis, 2010; Lewis, 2004). They are primarily concerned to show that transactive memory has a positive effect on group performance through the efficient processing of differentiated memories. From this perspective, transactive memory relates to the shared division of cognitive labor with respect to the encoding, storage and retrieval of different information across divergent knowledge domains. This analysis is correct, but incomplete. It focuses too strongly on differentiated, less enduring memory structures. Yet a careful reading of Wegner (1987: 197) reveals the importance he attaches to integrative transactive processes. He writes that, “Integrative processes are among the most important transactive events in groups because they manufacture new knowledge for the group.” Clearly, prior research has not adequately explored the role of integrative transactive memory.

Furthermore, very few studies even contemplate whether individuals’ autobiographical memories might be involved in transactive memory (see Wang, 2008). This is not surprising, for it is somewhat counter-intuitive to assume that autobiographical memory can be transactive and organizational. That said, evidence suggests that it could. We already know that people possess culturally derived self-construals as features of autobiographical memory (Markus & Kitayama, 2003), that people experiment with and adapt identities in response to social and organizational roles and collective narratives (Ibarra et al., 2010; Stryker & Burke, 2000), that transactive
memory serves to reinforce and validate a person’s self-concept (London et al., 2005), and that transactive memory underpins narratives of identity within organizations (Meyer et al., 2002). There is also a growing literature on collaborative memory as distributed cognition (Sutton, 2006). This cumulative literature strongly suggests that autobiographical memory can be subject to transactive processes within organizations, and that these processes will be critical for numerous organizational processes (Wang, 2008). Previous neglect of this possibility is best explained by the widespread emphasis on differentiated transactive memory and by the relative youth of autobiographical memory research (Conway et al., 2000). In contrast, my paper responds to this body of evidence by arguing that autobiographical memory does find organizational expression via transactive memory, is then stored in collective declarative memory, and plays a critical role in the micro-foundations of organizational routines.

**DEVELOPMENT OF THEORY**

To begin with, I assume that organizations exist to enact collaborative purposes, and in that sense, to craft a collective life narrative (Scott & Davis, 2007). Within such organizational contexts of shared purposes and goals, individuals co-create collective autobiographical memories. At the same time, many of the elements of autobiographical memory will be related to the collective psychology and behavior of the organization, as a social framework of shared goal pursuit (Halbwachs, 1938). Thus, these memories will be subject to transactive processes. Individuals and groups will integrate and distribute autobiographical memories (thus transacting such memories) as features of their shared and collaborative experience within the organization.

In fact, this process is exactly the same as that involved in the formation of transactive memory about organizational procedures and processes (Brandon & Hollingshead, 2004), excepting that the content is autobiographical memory relating to experiences within an
organization. In this fashion, members of organizations co-create shared autobiographical knowledge, and they naturally develop transactive autobiographical memory systems. Significant features of these transactive memory systems are then stored in organizational declarative memory, and thus transformed into a collaborative knowledge base.

The resulting autobiographical knowledge base has three layers, reflecting the structure of individuals’ autobiographical knowledge: life story schemas, lifetime periods and general events (Conway et al., 2004). Such transactive autobiographical memories are typically stored as declarative memories, as beliefs or knowledge, expressed in shared cognitive frameworks and schema (Moorman & Miner, 1998). I further argue that resulting autobiographical knowledge base inherits the broad functions of declarative autobiographical memory, albeit transposed to an organizational level: that is, it provides a framework for directive functions (motivation and goal setting), self functions (identity), and social functions (relational bonding and culture) (Bluck et al., 2005). Notably, similar functions are deeply implicated in the systemic processing of information into organizational memory, and in the micro-foundations of organizational routines and capabilities (Abell, Felin, & Foss, 2008; Anand & Manz, 1998).

Figure 2 summarizes the overall process. It depicts transactive autobiographical memory as the micro-foundations of organizational routines and their related beliefs and artifacts. The figure shows a schematic transactive autobiographical memory system, connecting three individuals labeled persons A, B and C. In this phase of the process, individual autobiographical memories become group transactive memories. Next, the figure shows how significant elements of transactive autobiographical memory are entered into the organizational knowledge base. In this phase of the process, elements of group-level memory are transformed into declarative organizational memories of the collective life narratives, long-term periods and general events.
That is, individual autobiographical memories are transformed into collective organizational memories. In the third phase of the process, these organizational declarative memories form part of the micro-foundations of important categories of organizational routines, and especially routines of the organization’s self, social and directive functions. Moreover, Figure 2 depicts the process as iterative, as the enactment of routines feed back into the transactive autobiographical memory system. Via this process, the macro-level contents of organizational memory are retrieved into the micro-level memory systems of individuals and groups, thereby influencing the performance of recurrent organizational behaviors, otherwise defined as routines.

Micro-foundations of Organizational Routines

Recall the three functions of autobiographical memory: directive (motivation and goals), self (identity), and social (bonding and culture) (Bluck et al., 2005). I contend that transactive autobiographical memory will serve the same functions at the organizational level. Concerning directive functions, transactive autobiographical memory helps to frame and motivate goal-directed routines, for both individuals and organizations (Walsh, 1995). Regarding self functions, transactive autobiographical memory underpins the nature and continuity of personal and organizational identity over time, and related routine behaviors (Ibarra et al., 2010). With respect to social bonding and culture, transactive autobiographical memory supports the terms of communal membership, providing a sense of belonging and transmitting shared values and meaning over time (DiMaggio, 1997). The following sections expand this discussion.
Directive Functions - Motivation and Goals

By supporting the organization of past, present and future events, transactive autobiographical memory helps to locate events within an unfolding narrative, allowing collective motivations and goals to be derived and understood (see Bluck et al., 2000). Members of the organization can rely on each other to encode, store and retrieve significant aspects of their collective narrative (Pasupathi, 2001). By sensing the significance and temporal continuity of prior events, members can project future goals and seek to cause future events. New problems, opportunities and challenges are framed and assessed in relation to the firm’s unfolding narrative. Current and future events are accorded meaning and significance if they cohere with transactive autobiographical memory. In this way, transactive autobiographical memory supports the attribution of cause and effect to past and future events, and provides a micro-foundation for routines of sense-making and goal-setting. Transactive autobiographical memory thus underpins common goals, decision procedures and goal-directed routines.

Self Functions – Identity and Memory

Members of the organization will also retrieve knowledge of organizational identity from transactive autobiographical memory, and especially from its store of organizational life stories and collective narrative. Transactive autobiographical memory thereby makes a fundamental contribution towards the temporal continuity of a distinctive organizational identity (Albert & Whetten, 1985). Moreover, by relating their autobiographical self to the organization’s life story, individuals acquire a sense of personal meaning and identity in that context, which then support routines of organizational identitification (Ibarra et al., 2010).

At the same time, transactive autobiographical memory partly determines which information and knowledge is selected for storage into declarative memory. Information that is
consistent with and reinforces the existing store of transactive autobiographical memory will be more likely to qualify, and thus enter into declarative memory. Memory selection is therefore a critical function of transactive autobiographical memory, impacting all aspects of organizational search and learning. Transactive autobiographical memory may therefore influence the bounds of possible learning and absorptive capacity (Cohen & Levinthal, 1990). Specifically, if new information is inconsistent with, or lacks meaning in relation to, the existing transactive autobiographical memory system, then this information may be less likely to be absorbed into memory. Similarly, if the entire transactive autobiographical memory system is highly specific and integrated, new information will be more likely to lack such meaning and consistency, resulting in low overall absorptive capacity (see Todorova & Durisin, 2007).

Social Functions – Culture and Bonding

Next, consider cultural routines. Culture supports an organization’s normative values, rules and systems of meaning, and plays a major role in organizational emergence, growth and survival (Bhide, 1996). Especially in a world characterized by change and diversity, culture provides a sense of coherence, unity and continuity within organizational routines. Through the adoption of an organization’s cultural routines, individuals attach perceptions of the self and others to the organization and find meaning in the roles and relationships they have within it. They learn the criteria for organizational meaning and right action. Through these myriad functions, organizational culture helps to define common values and establishes the framework for future remembering (Chiles, Meyer, & Hench, 2004).

Regarding the cultural role of transactive autobiographical memory, recall that autobiographical memory is socially co-created (Polya, Laszlo, & Forgas, 2005). Also recall that Wegner (1985) argues that transactive memory can be understood as a synonym for culture.
When these processes are joined within transactive autobiographical memory, they have a profound influence on culturally grounded routines. The resulting system of transactive autobiographical memory will store and transmit the organization’s enduring values, shared meanings and norms. As members join the organization, they access and transact these memories and incorporate the organization’s cultural norms and routines into their own sense of meaning and value. Past and future events and experiences then acquire meaning and value by corresponding to these features of transactive autobiographical memory.

In similar fashion, transactive autobiographical memory underpins routines of social bonding. This occurs by virtue of the fact that transactive autobiographical memory stores the historic norms of organizational belonging. That is, in order to belong, persons must collaborate in transacting transactive autobiographical memories and seek to enact the collective narrative. In this way, transactive autobiographical memory supports the very process of organizing itself, defined as the development of a system of continuous social relationships among people sharing a common goal or purpose (Aldrich & Ruef, 2006). The emergence of new organizations can then be understood as the enactment of a “culturally endorsed [organizational] life narrative” (Conway, Wang, Hanyu, & Haque, 2005: 747). Founders then become actors in a collective narrative, not only agents of organizational creation (Downing, 2005; McAdams, 2006).

**DISCUSSION**

Prior research suggests that routines are stored as recurrent action patterns in procedural memory and reference information stored in declarative memory (Becker, 2004). Hence, both procedural and declarative memories are implicated in the micro-foundations of routines. Procedural memory captures the behavioral components of routines, while declarative memory captures the informational components. My paper contributes to an explanation of the micro-
foundations of these phenomena by illuminating the potential role of transactive autobiographical memory as a source of the declarative memories that underpin many important routines, and how these memory systems reflect and guide patterns of recurrent action.

By advancing these arguments, my paper makes a number of additional contributions. Firstly, it expands the role of transactive memory in relation to routines, by including transactive autobiographical memory as a component of declarative organizational memory (Lazaric et al., 2005). In contrast, most prior research has focused on declarative memory relating to production processes and other functional routines. The overriding goal of this research has been to explore and explain sources of functional efficiency in collaborative activity. Yet, as my paper argues, significant components of organizational declarative memory are related to shared life stories and collective narrative. My paper has shown how this content might be systematically incorporated into routines via the mechanisms of transactive declarative memory.

Secondly, my paper contributes towards research into the micro-foundations of routines by exposing the role of transactive autobiographical memory in developing and guiding routines of sense making, social bonding, organizational identity, motivation and goal setting (Abell et al., 2008). Indeed, studies show that declarative memory plays an important role in routine behaviors. The gap filled by this paper is to suggest how collective autobiographical memories are incorporated into organizational memory and support the development and adaptation of routines. That said, further research is required to explain the exact mechanisms of memory storage and retrieval in relation to the routines stored as procedural memory (Cohen et al., 1996).

Thirdly, combining the major contributions just described, my paper suggests a deeper, broader role for declarative memory in relation to routines. This derives from the fact that transactive autobiographical memory includes long-term narrative structures that frame whole
stages of the organizational life-cycle. In contrast, once again, prior research focuses on declarative memory relating to short time frames associated with organizational processes and procedures, such as operational procedures (Adler et al., 2009); whereas my paper highlights the significance of long-term narrative structures relating to lifetime periods and life stories. These structures feed into and derive from important routines, such as routines of collective identity, culture, social bonding and goal-setting. Future empirical research should investigate these phenomena and their effects more deeply.

To do so, empirical researchers can employ methods that are well-established in psychology and organizational behavior. Firstly, memory psychologists use a range of experimental and field techniques, including the collection and analysis of self-reported life stories and documented autobiographical narratives (Bluck et al., 2005). The same techniques could be applied to investigate the co-creation of autobiographical memory within organizations. Reliable empirical methods are also available for research into transactive memory. Data sources include self reports, documentary records, site observations, simulations and experiments (Lewis, 2003; Ren, Carley, & Argote, 2006). By employing such methods, it will be possible to test whether transactive autobiographical systems exist in organizations. Longitudinal studies could then test whether transactive memory systems underpin transactive autobiographical memory. Further research would then be possible to investigate the influence of transactive autobiographical memory on socio-cultural, identity and directive functions.

As a priority, future empirical studies should investigate the different layers and temporal frames of transactive autobiographical memory and their variable effects. Firstly, using narrative methods of analysis, studies can investigate the ways in which organizational life stories influence an organization`s enduring identity and capacity for change. Prior studies suggest that
by framing the overall history of the organization, narratives may significantly influence the organization’s capacity for change, search and learning (e.g., Ibarra et al., 2010). Secondly, a variety of qualitative and quantitative techniques could be employed to study transactive autobiographical lifetime period memories. These studies may help to explain how and why some organizations are more successful in managing innovation and cultural change (e.g., Bartel & Garud, 2009; Burgelman, 1994). Thirdly, through qualitative analyses of transactive autobiographical general event memories, we may achieve better understanding of why some organizations possess more adaptive routines (Feldman et al., 2003; Felin et al., 2009).

Furthermore, if future research confirms the existence and functions of transactive autobiographical memory, it will have significant practical implications. Most directly, it should then be possible to design techniques for managing the development and effects of transactive autobiographical memory. For example, it may be possible to improve an organization’s capacity to learn by intervening to amend the selection, storage and retrieval of transactive autobiographical memories. Further practical implications then flow for the management of organizational change and adaptation. In like fashion, it is feasible to consider practical interventions that would improve the enactment and adaptation of organizational routines, networking behaviors, the management of culture, goal setting and decision-making.

**Conclusion**

Fundamentally, organizations exist to enact shared goals and aspirations. When viewed from this perspective, organizations can be conceived in terms of collaborative life stories and collective narrative. Thus conceived, organizations possess transactive autobiographical memory systems. Importantly, transactive autobiographical memory is a novel conception that captures the distinct form and function of an organization’s declarative memory—namely an organization’s
memory of its collective narrative. These memory systems contain a structured knowledge base of organizational life story schema, lifetime periods and general event memories. When retrieved and combined with procedural memories, these memory systems constitute a significant component of the micro-foundations of organizational routines, especially those routines relating to identity and memory, social bonding and culture, motivation and goal-setting.
REFERENCES


Figure 1
The Autobiographical Knowledge Base

(Adapted from Conway et al., 2004: 498)
Figure 2

Micro-Foundations of Organizational Routines

Systems of Transactive Autobiographical Memory

Person A
Life story schema
Lifetime periods
General events

Person B
Life story schema
Lifetime periods
General events

Person C
Life story schema
Lifetime periods
General events

Translation into Organizational Declarative memory

Life Stories
Memory of the total organizational life narrative

General Events
Memory of major organizational general events

Lifetime Periods
Memory of long-term life periods

ORGANIZATIONAL GROUPS

ORGANIZATIONAL MEMORY

Self Functions:
Identity and Memory

Social Functions:
Cultural Norms and Social Bonds

Directive Functions:
Motivation and Goal Setting

Micro-Foundations of Organizational Routines