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REFLECTIONS ON THE 2009 *AMR* DECADE AWARD: DO WE HAVE A THEORY OF ORGANIZATIONAL LEARNING?

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Having received the "Decade Award" for the most cited *AMR* article from the past decade, we reflect on how our framework of organizational learning (OL) has been used in subsequent research and whether a theory of OL has emerged. Our citation review revealed that although some of the subsequent research has added to the original work, the challenge to develop an accepted theory remains unrealized. We offer promising directions for developing a theory of OL.

In 2009 the *Academy of Management Review* instituted the "Decade Award" to recognize the most cited article from the past decade. Our 1999 article, "An Organizational Learning Framework: From Intuition to Institution," received this award. The occasion prompted us to reflect on how the article has been used in subsequent research and whether a theory of organizational learning (OL) has emerged.

Although not presented in the original article, the issue of theory and theory development was quite central in the reviewers' comments and correspondence. In fact, the paper was conditionally accepted on the proviso, among other things, that we remove the term *theory* from the original title, "Organizational Learning: Toward a Theory," and replace it with the term *framework*. The reviewers argued that we had not presented a theory. The important question of whether there is, and should be, a theory of OL remains unresolved. A substantial amount of research has been published in the intervening years that might cumulatively constitute a theory of OL, and, therefore, it is an opportune time to revisit the framework and consider whether these developments merit upgrading it to theory status.

We gratefully acknowledge the feedback and insights provided by Amy Hillman, Mark Easterby-Smith, Harry Lane, and Dusya Vera. Our 1999 article benefited considerably from the care, attention, and insight provided by Andy Van de Ven, Ken Smith, and three anonymous reviewers. We extend our thanks to them.

Our intention is to move in the direction of the aborted title of the earlier manuscript in order to strengthen OL theory. We begin our discussion with a recap of the reviewer comments pertaining to OL theory. Next, we examine papers citing the 1999 article and reflect on how the article has been used, and we assess whether a theory of OL has emerged. Then, having established that no theory of OL has emerged, we discuss critical elements for organizational theory development. Finally, we conclude with promising directions for developing a theory of OL.

OL FRAMEWORK OR THEORY?

The reviewer and editor correspondence for the 1999 paper reveals key insights about the need for a theory and what such a theory might entail. We received the first review of the paper in December 1996, and it was clear the manuscript had almost been rejected. One of the reviewers expressed a major concern:

> The objective of the paper is somewhat of a limitation. A "unifying framework" by design tends to be accommodative of different views. It does not necessarily further anyone or a collection of views to the depth and strength of a good theory. It shies away from strong critique and pointing to theoretical gaps. . . . The paper currently lacks in critical judgments about the worth of OL theories. At this stage of development of OL theory, we need contributions that are much more critical of what has been done before. Frankly, some of the past research is not worthy of being unified. Without that critical insight, it is difficult to establish the ground for theory development.

Although we understood the general message, we did not agree with the reviewer, who seemed to be pitting a "unifying framework," accommodating different points of view, against theory, which would be critical and less accommodating. In our view good theory can be both critical and accommodating. We saw the 4I framework as spanning different paradigms and bridging the different ontologies and epistemologies underlying those paradigms. In an early version of the paper, we had employed Burrell and Morgan's 1979 framework of sociological paradigms and argued that the 4I processes (intuiting, interpreting, integrating, institutionalizing) bridged and unified those different paradigms. However, in subsequent revisions reviewers suggested removing this section. Easterby-Smith (1997), in his influential article on the disciplines of OL, argued that the different ontological bases of the distinctive disciplines with their different research approaches were best dealt with in parallel streams, rather than with a unifying theory. While we agree with his observation that there are different ontological bases, there is an opportunity and a need for a theory that enables us to build on, and integrate, the wealth of research in OL.

Heeding the advice provided by the consulting editor and reviewers, we substantially revised the paper and renamed it to reflect our intention to move "toward a theory" of OL. We submitted it for second review in December 1997, and shortly thereafter we were given the opportunity for another revision. The main critique at this point was that the paper was trying to do too much, and the reviewers encouraged us to focus on the theory. As one of the reviewers described:

> There is good news and bad news in this revision. The good news is that the authors have responded to the challenge to add value by clarifying and expanding upon their theory of organizational learning, which adds a focus on levels and types of learning to the existing literature, which had been absent. The theory is interesting and has face validity; my hope is that it will stir a reaction from the OL community and inspire scholars to begin researching the links among the levels of learning that are described here. . . . Here's my advice. The theory is the thing here. . . . What is important is to set up the need for a new theory that adds to our understanding of OL phenomena.

These comments signaled to us the important and challenging task of moving toward a theory of OL. After addressing the concerns raised, we resubmitted the paper, and on September 3, 1998, we received the gratifying news that it was conditionally accepted with the proviso, as mentioned above, to remove the term *theory* from the title. Andy Van de Ven wrote:

> Your paper does not yet present a theory; instead it provides a useful framework or model for understanding individual and organizational learning. A framework or model consists of a set of concepts, while a theory explains how, why, and when these concepts are related. By these definitions, your 4Is (intuiting, interpreting, integrating, and institutionalizing) represent a framework, but the relationships between these constructs are not worked out enough to constitute a theory. . . . Thus, my initial inclination was to reject your paper because it does not yet present an adequate theory. After reflecting on this and Ken Smith's wise advice that "no paper is perfect but we want to feel proud of each paper published in *AMR*," I conclude that we (and you) should be proud of the contribution your paper makes as a framework of organizational learning. But we should not claim that it presents a theory.

Now, more than ten years later, we have the opportunity to reflect on whether our framework has become a theory. Unfortunately, there is no consensus on what constitutes theory. Often, "it is easier to identify features of manuscripts that are not theory than it is to specify exactly what good theory is" (Sutton & Staw, 1995: 378). In trying to pin down what theory is, Sutton and Staw suggest that

> theory is about the connections among phenomena, a story about why acts, events, structure, and thoughts occur. Theory emphasizes the nature of causal relationships, identifying what comes first as well as the timing of such events. Strong theory, in our view, probes underlying processes so as to understand the systematic reasons for a particular occurrence or nonoccurrence. It often burrows deeply into microprocesses, laterally into neighboring concepts, or in an upward direction, tying itself to broader social phenomena. It usually is laced with a set of convincing and logically interconnected arguments. It can have implications that we have not seen with our naked (or theoretically unassisted) eye. It may have implications that run counter to our common sense. As Weick (1995) put it succinctly, a good theory explains, predicts, and delights (1995: 378).

However, from that broad base there are stark differences on the criteria for good theory, and it is not surprising that a positivist tradition, em-

phasizing methodological elements such as operational definition, falsifiability, and utility, is prevalent. We see no need to adopt these more specific criteria that are tightly linked to a positivist view, and we suggest that the research community, with its plurality of approaches, is better served by Weick's notion that a good theory explains, predicts, and delights. We agree with Sutton and Staw that researchers will recognize theory in its presence and absence. Our experience examining subsequent research has borne that out. We can, however, suggest that elements of the 4I framework are important underpinnings of the microprocesses and interrelationships called for in a theory of OL.

LEARNING FROM THE RESEARCH CITATIONS

As of November 2010, the ISI Web of Knowledge listed 373 citations, including 229 articles, 80 proceedings, and 58 reviews, of our 1999 article. Of this pool of citations, 314 were available in detail, for which we recorded the title of the article, the author(s), the journal, and the publication year. For each article we traced the number of times the 1999 article was cited and the location of the citation in the article (introduction, body, conclusion) to gauge the nature of the original article's use. In addition, we analyzed whether the citations incorporated key characteristics of the original article: process orientation, including the 4I processes, multilevel thinking, dynamic orientation, and strategic renewal as the outcome variable. We also reviewed about sixty-five books that had been published on OL in search of a developing theory.

The citation analysis revealed slightly more empirical (60 percent) than conceptual (40 percent) manuscripts. While the majority of citations come from U.S.-based journals, the split by geographic region shows strong international interest in the article (United Kingdom, Canada, continental Europe, and Asia). Of 314 articles assessed, 25 were published in *Management Learning*, a journal dedicated to research on learning. The 1999 article has been used in research on OL, management, entrepreneurship, strategy, operations management, technology, marketing, information technology, and the medical field. Subsequent research has drawn from a wide range of theoretical lenses, such as OL, absorptive capacity, entrepreneurship theory, the resource-based view, sensemaking, learning curve theory, network theory, chaos theory, and structuration theory, further indicating the framework's broad appeal. Citations increased steadily over the years, with peaks in 2007 and 2009, and continued strong interest.

Beyond this general assessment, we examined the nature of these citations to understand how the field at large has made sense of the 4I framework. Which elements of the framework have become well established in the literature in a way that is consistent with the original intentions and expectations? Which elements have so far remained underrepresented?

The bulk of the citations were what we call "light": about 55 percent of the reviewed research cited the 1999 article only once, either in the introduction to set up the argument or in the body to refer to the article in passing. About 25 percent cited the original article two or three times, typically also in the introduction or the body. In about 20 percent of the reviewed articles, the number of citations reached four or more, and these were generally spread throughout the entire manuscript. Several articles relied heavily on the 4I framework, explicitly building on it and integrating it with other theoretical lenses (e.g., Berends & Lammers, 2010; Lawrence, Mauws, Dyck, & Kleysen, 2005; Sun & Anderson, 2010; Vera & Crossan, 2004).

Numerous citations referenced the framework as if it were a theory (e.g., Berends & Lammers, 2010; Gong, 2003; van Driel & Bogenrieder, 2009). Perhaps the availability of the 4I framework may have inadvertently short-circuited the hard work of OL theory development. Have we as a field shied away from the tough questions and the challenging work of building theory? We return in this retrospective to the foundation of the framework to further examine the nature of its use in the literature and to assess what is still needed for a theory of OL.

Our 1999 article outlined four premises that underlie the 4I framework. We restate those premises here and then address how they have been taken up and developed by authors who cite the original article.

- Premise 1: OL involves a tension between assimilating new learning (exploration) and using what has been learned (exploitation). This is the challenge of strategic renewal.
- Premise 2: OL is multilevel—individual, group, and organization.

- Premise 3: The three levels of OL are linked by social and psychological processes—intuiting, interpreting, integrating, and institutionalizing.
- Premise 4: Cognition affects action, and vice versa.

Premise 1—OL and Strategic Renewal

Strategic renewal is the endogenous variable of interest in the 4I framework, which balances the tension between exploration (learning new ways) and exploitation (exploiting what already has been learned). The citations revealed limited attention to strategic renewal (for exceptions see Ferguson-Amores, Garcia-Rodriguez, & Ruiz-Navarro, 2005; Lumpkin, 2005; Ozsomer & Gencturk, 2003). Articles that built on the insights of strategic renewal were often coauthored by one of the authors of the 1999 article (e.g., Bontis, Crossan, & Hulland, 2002; Crossan & Berdrow, 2003). However, some researchers had a strong emphasis on the tension between exploration and exploitation, without using the term *strategic renewal* (e.g., Holmqvist, 2009).

These findings are not surprising to us since it has been our experience that few strategy researchers have taken an interest in OL, while OL researchers, many trained in organizational behavior with underlying expertise in psychology and sociology, have been uninterested in strategy. Our original interest in linking OL and strategic renewal was in part to close what we saw as a gap in the disciplines. We continue to see an opportunity and a need to forge these connections. Thought leaders in multilevel theory and research echo this aim (Kozlowski & Klein, 2000).

Although there has been little research linking OL to strategic renewal, there has been a wealth of research linking OL to strategy domains, particularly learning in strategic alliances and joint ventures. However, in most of these studies learning is used in a more general sense, rather than as a rich theoretical construct to unpack learning processes. As well, many constructs in the strategy literature are not linked to OL, such as dynamic capabilities, absorptive capacity, and knowledge management. There is an opportunity to link these concepts to an OL theory and strategic renewal.

"For renewal to be strategic it should encompass the entire enterprise—not simply the individual or group" (Crossan et al., 1999: 522). Strategic renewal is a multilevel phenomenon. Reviewed citations typically have focused on learning in one or two particular levels of analysis, instead of explicitly taking learning and renewal as encompassing the entire organization.

Premise 2—Multilevel Research in OL

The 4I framework is multilevel because it spans individual, group, and organizational levels of analysis, as stated in Premise 2. The goal and objective of multilevel theorizing in general is to "identify principles that enable a more integrated understanding of phenomena that unfold across levels in organizations" (Kozlowski & Klein, 2000: 7). A reasonable consensus has emerged that a theory of OL needs to be considered across the individual, group, and organizational levels (Crossan et al., 1999: 524; Easterby-Smith, Crossan, & Nicolini, 2000).

However, only a few studies, which tend to be more recent, have tackled the multilevel nature of OL explicitly (e.g., Berends & Lammers, 2010; Casey & Goldman, 2010; Di Milia & Birdi, 2010; Foss, Husted, & Michailova, 2010; Holmqvist, 2004; Vera & Crossan, 2004). One empirical test of the multilevel link between learning at the individual, group, and organizational levels with organizational performance shows some support for the 4I framework (Di Millia & Birdi, 2010). This study found that organizations engaging in learning practices at one level are more likely to engage in practices at another level. "While organizational learning is more than the sum of ILP (individual learning processes) and TLP (team learning processes), they make possible organizational learning" (Di Millia & Birdi, 2010: 493). Many authors have argued for the precedence of one level over the other—for example, the group level (Edmondson, 2002; Wilson, Goodman, & Cronin, 2007) or the individual level (Bryant, 2005; Cyert & March, 1963). While it is important to develop "within-level" understanding of OL, there is a greater need to understand how the levels relate and constitute OL. In fact, there may be a danger in isolating levels, as we discuss later. We see no value in the type of discourse that aims to identify *the* critical level responsible for OL. Instead, we maintain that processes at all levels are important to explain the phenomenon, which is consistent with recent empirical tests of the 4I

framework (Di Millia & Birdi, 2010) and multilevel theory (Klein, Tosi, & Cannella, 1999; Kozlowski & Klein, 2000).

This relative dearth of multilevel research over the past decade is puzzling, given advances in multilevel research and methods. Sophisticated statistical methods and techniques for modeling multilevel relationships should help multilevel research (e.g., Bryk & Raudenbush, 1992; Kreft & De Leeuw, 1998; Yammarino & Dansereau, 2008), with some authors (Chen, Bliese, & Mathieu, 2005) offering specific and comprehensive procedures to validate multilevel constructs. These advances should aid in the conduct of multilevel research. Nonetheless, many researchers may not feel competent in their command of the literature and methodologies that span levels (Klein et al., 1999). As Kozlowski and Klein point out, "Multilevel theory building presents a substantial challenge to organizational scholars trained, for the most part, to 'think micro' or to 'think macro' but not to 'think micro *and* macro'—not, that is, to 'think multilevel'" (2000: 11). There is an opportunity for OL researchers to face this challenge openly because OL is a phenomenon that spans multiple levels, including the external organizational context.

Premise 3—The 4I Processes

Tightly linked to the multilevel nature of the framework are the four underlying processes, the 4Is: intuiting, interpreting, integrating, and institutionalizing. These four processes connect the three levels of analysis.

The three learning levels define the structure through which OL takes place. The processes form the glue that binds the structure together; they are, therefore, key facets of the framework. Intuiting and interpreting occur at the individual level, interpreting and integrating occur at the group level, and integrating and institutionalizing occur at the organizational level (Crossan et al., 1999: 524–525). We have pushed in the direction of advancing a theory of OL by describing an OL framework that incorporates the *dynamic multilevel* nature of the phenomenon and captures the rich interplay between process and level (Crossan et al., 1999: 535).

OL is both a process and a product. While the citation analysis revealed widespread understanding of learning as a process, the specific processes that lead to learning outcomes and that link levels of analysis—intuiting, interpreting, integrating, institutionalizing—remain underutilized. Only a small portion of the citing articles have made explicit use of the 4I processes (e.g., Berends & Lammers, 2010; Bontis et al., 2002; Crossan & Berdrow, 2003; Jacobs & Coghlan, 2005; Schilling & Kluge, 2009). Yet we believe there is the potential for much deeper insight into the 4I processes. Our original article just scratched the surface. These processes have, for example, been helpful in highlighting specific barriers to learning across the three levels of analysis (Schilling & Kluge, 2009). Recent work has demonstrated that the processes of the 4I framework are often connected in complex and nonlinear ways (Berends & Lammers, 2010).

Despite the underlying recognition of learning as a process, the citation review revealed a stronger interest in the content of learning, including the acquisition and transfer of information and skills (Casey, 2005), than in the processes that underpin OL. Perhaps this focus is explained by the interest from fields such as IT, technology, and product innovation. If there is more interest in the stocks of learning than in the flows of learning (Bontis et al., 2002), then more multilevel theory is clearly needed to investigate the connections between levels of analysis (flows).

Premise 4—Cognition and Behavior

At the time we developed the 4I framework, there was an ongoing debate about the relationship between cognition and behavior, and it was our intent to forge a stronger link between these two concepts and across levels. Cognition and behavior are closely related in OL (Edmondson, 2002). Our citation review revealed some subsequent work recognizing this link (e.g., Berends & Lammers, 2010; van Driel & Bogenrieder, 2009). The cognition/behavior dichotomy breaks down somewhat during the transition from individual to group to organization. We had positioned the organization as more than the sum of individuals, and, hence, it was not just collective cognition or behavior but, rather, the learning captured at the organizational level that had become institutionalized in the form of nonhuman elements such as products, processes, rules, routines, systems, structure, and strategy. And although we used the terms *cognition* and

behavior, the distinction we were intending to bridge was more far reaching and better captured in terms such as *content* and *process*.

The pattern of subsequent citations revealed that researchers rarely refer to cognition and behavior; rather, they separate the "what" and "how" of OL. Research emphasizing knowledge management is less likely to dig deeper into fundamental processes (e.g., Koskinen, 2010; Sun, 2010). In contrast, some recent work appears to emphasize content and process. For example, one longitudinal study on the implementation of knowledge management shows discontinuities in the associated process (Berends & Lammers, 2010).

As we describe later, research that emphasizes practice and activity tends to blend cognition and behavior. While there are advantages to synthesis, it risks losing the powerful insight that arises from attention to each. For example, affect, cognition, and behavior are processes at the individual level of analysis that allow for the emergence of a multilevel phenomenon such as OL (Kozlowski & Klein, 2000).

Have we moved closer to a theory of OL during the last ten years? Our citation review of the subsequent research suggests that no such theory exists yet. No article in a major journal has been published purporting to be such a theory. Indeed, it is surprising how little theoretical development has occurred. However, even without an accepted theory, much OL research continues to flourish and be published. Especially active is the part of the field that applies OL theory to specific research phenomena, such as the positive effect of learning on joint venture success (e.g., Fang & Zou, 2010), or of learning on entrepreneurial opportunity generation (Dimov, 2007; Lumpkin, 2005). This type of applied research is important because it expands our knowledge about learning under specific conditions. But we believe the field is vulnerable. Without a sound theoretical foundation, it is difficult to even establish the boundaries of the field, let alone advance our understanding of the underlying phenomena. A solid theoretical foundation allows researchers to build on others' findings and insights rather than struggle with further fragmentation of the field that stems from a lack of common theoretical heritage and grounding.

Although we were not able to uncover a theory of OL, we examined subsequent research for elements contributing to OL theory.

CRITICAL ELEMENTS FOR OL THEORY DEVELOPMENT

Bapuji and Crossan (2004) documented the substantial growth in the empirical research on OL and observed that we as a field have moved from asking questions to providing answers. Nonetheless, this empirical research has focused largely on application. Bapuji and Crossan conclude, "A comprehensive model of the internal and external factors that facilitate organizational learning is not yet available," and go further to caution that "in the absence of vibrant research on the core learning phenomenon, research that adopts a learning perspective could be using outdated and unrelated concepts" (2004: 411). Yet the question remains as to whether we have actually deepened OL theory or simply added more complexity to a framework. Although analogies are risky business, we consider OL theory to be like a tree, with a trunk and then major branches from which thousands of leaves may flourish. There have been a lot of leaves placed on branches, and to some degree new branches added to the tree, but little, if any, work has been done to establish a strong foundation or theory—the trunk. In the following section we discuss some of the new branches revealed in our analysis. Easterby-Smith et al. (2000) identified several of these new branches when they took stock of the debates and future directions in OL.

Power, Politics, Emotion

The terms *power, politics,* and *emotion* do not appear in the 1999 article. We were not trying to avoid these terms, but our intention was to describe the deep-rooted processes that link learning across levels and explain strategic renewal. In many respects the language we chose was a substitute for terms such as power and politics. Our sense was that there were processes such as intuiting that were hidden from view and little in the way of research that sought to explain how ideas that were often preverbal were articulated, shared, and became part of the fabric of organizations.

Nevertheless, we see benefits in the explicit focus on emotion, politics, and power to determine whether there are additional insights to be gained. Lawrence et al. (2005) enriched the 4I framework when they examined how power and

politics could be integrated into the framework. They identified different forms of power operating across the levels to explain why some insights are institutionalized while others are not. Furthermore, they identified power and politics as the "social energy that transforms the insights of individuals and groups into the institutions of an organization" (2005: 180) and suggested that "politics of organizational learning are not a dysfunctional aspect that needs to be remedied but, rather, are an intrinsic part of the process that should be appreciated and understood by organizational researchers and leveraged by managers and employees" (2005: 188). They incorporated processes such as moral suasion, negotiation, agenda setting, socialization, and training as well as elements such as physical layout and information systems to describe ways in which learning moves across the levels.

Vince (2001) did not make the direct link to the 4I framework. However, his thesis was that "organizations are learning when the 'establishment' that is being created through the very process of organizing can be identified and critically reflected upon" (2001: 1325). He illustrated this thesis through a case study of change in a multinational company. In particular, Vince's work deepens the understanding of the organizational level of analysis and the act of organizing. His article suggests that "by addressing how employees relate to organizational practices and constructions of reality, to the structural features that locate them in positions of inequality or impotence" (2001: 1331), we can see how a political perspective enhances our understanding of OL. As well, his article introduces elements of emotion, such as anxiety, envy, enthusiasm, and dislike, and points to the ways emotions are expressed, ignored, or avoided, which ultimately impacts learning.

Consistent with this view, Blackman and Sadler-Smith (2009) examined the role of the silent and silenced in OL, differentiating between silence resulting from that which (1) cannot be spoken (tacit and intuitive knowing), (2) might be spoken (insightful knowing and preconscious knowing), and (3) is silenced and will not be spoken (unconscious repressed voice, conscious withheld voice, and conscious suppressed voice). Their theorizing exposes the meanings that reside in silence. We see this emphasis on power, emotion, and politics as an important branch of OL that should be accounted for in any OL theory.

Leadership

We did acknowledge in the 1999 article that there was a need to examine the role of leadership as it relates to the 4I processes. However, it is surprising that there has been little uptake on this call (for exceptions see Berson, Nemanich, Waldman, Galvin, & Keller, 2006; Jansen, Vera, & Crossan, 2009; Vera & Crossan, 2004). Vera and Crossan (2004) forged a link between the 4I framework and leadership by examining how transformational and transactional leadership impact OL. They state that "the fundamental premise of our model is based on a contingent view of leadership: at certain times organizational learning processes thrive under transactional leadership, and at other times they benefit more from transformational leadership" (2004: 226). The explicit focus on the role and types of leadership underscores the theme arising from power, politics, and emotion around the importance of understanding the factors that influence learning across levels and the influential role of leaders in those processes.

Berends and Lammers (2010) refer to "interventions" as an important driver of continuities and discontinuities in OL. Managerial interventions may affect who is included in the learning process and at what point in time. Both of these impact learning processes and outcomes. "Discontinuities are associated with abandoned learning flows, delayed processes, fragmented learning results and limited opportunities for institutionalization beyond a local context" (Berends & Lammers, 2010: 19).

Hannah and Lester reinforce a multilevel view of OL and suggest how leaders intervene in OL:

> 1) at the micro level by fostering followers' readiness to learn and promoting their learning through engagement in development experiences, 2) at the meso level by promoting and facilitating effective knowledge-centric social networks, and 3) at the macro/systems level by scanning, sanctioning, and institutionalizing critical emergent knowledge using specific leadership and management practices (2009: 34).

In general, there is an opportunity for a better sense of agency as it relates to OL. In the same way that a theory of OL needs to anticipate insights from power, politics, and emotion, it

also needs to account for the role of leadership (and followership). However, a theory of OL needs to consider carefully the meaning of leadership. It would be unfortunate if it were viewed solely from an upper echelon perspective, or even from a simple hierarchical perspective. Rather, it is evident that individuals can influence at least some of the learning processes from wherever they reside in organizations, and a theory of OL needs to account for this potential.

OL Barriers, Levels of Learning, and Types of Learning

Building explicitly on the 4I framework, Schilling and Kluge (2009) resurrected the notion of single loop versus double loop and provided a review of the literature to identify barriers to OL. The list of barriers to each of the four processes is lengthy, and we are left with a larger question of how we can conceive of these barriers in meaningful ways so that we can account for them in a theory of OL. Although these authors did not explicitly link the barriers to types of learning, their research reminds us that there are different qualities and types of learning. This is echoed in the work of Vera and Crossan (2004), which suggests different types of learning are associated with different types of leadership.

Holmqvist (2004) extended the 4I framework to link intra- and interorganizational learning. This is entirely consistent with our thinking, and indeed the 4I framework has been applied to joint ventures (Tiemessen, Lane, Crossan, & Inkpen, 1997). The theme of exploration and exploitation arises in Holmqvist's work, and again it serves as a reminder of the need to keep in mind the different types of OL.

Extending the levels of learning, Haunschild and Chandler (2008) examined the institutional level, which in institutional theory is at the population level. This should not be confused with the 4I framework's institutionalizing, which was intended to capture learning that becomes embedded in the organization. Nonetheless, expanding a theory of OL to embrace learning at the level of the population is a valuable extension. As well, this may entail applying OL theory to understand the exchange relationship between organizations and society.

OL and Knowledge Management

Since the publication of the 1999 *AMR* article, there has been exponential growth in research on knowledge, knowledge management, and knowing, much of which has not been connected to OL. Vera, Crossan, and Apaydin (2011) provided an overview of the two fields and described areas of overlap and distinction. It is interesting to note that for some time there were two separate and distinct conferences relating to knowledge and OL. In 2004 Mark Easterby-Smith encouraged a process that eventually brought these two conferences together, and it is now called OLKC (Organizational Learning, Knowledge, and Capabilities).

The development of knowledge and knowledge management stimulated research on knowing, which is closely associated with learning. In particular, the underlying ontology and epistemology that emerged around knowledge fostered vibrant debate about the sociology of knowing and learning, as discussed below. In general, a theory of OL should help to account for the nomonological net of the many related concepts, such as sensemaking, knowledge management, absorptive capacity, dynamic capabilities, and organizational change.

Social Processes of OL—Practice and Activity

There have been various approaches to the deepening of the social learning processes; one has been to emphasize the dynamic aspect of the process. In developing the 4I framework, we were conscious of using verbs, as opposed to nouns, to describe the process—intuiting versus intuition, interpreting versus interpretation, integrating versus integration, institutionalizing versus institutionalization. Consistent with this emphasis on verbs, Clegg, Kornberger, and Rhodes (2005) focused on the process of organizing, linking it to learning and the process of becoming. As they point out, "Considering learning in terms of becoming focuses on movement rather than that which is moved" (2005: 159). "Coupled with a sensitivity to becoming, learning can be considered as being constituted in the interplay between order and chaos, and therefore as being the driving force beyond organization" (2005: 162). As well, the multilevel dynamic

view of OL we proposed sought to articulate the situated nature of OL in which the individual and context are intimately intertwined.

Casey (2005) picked up this theme of connectivity of the learner and the context or environment. Rather than teasing apart the levels, Casey employed Parson's activity theory to connect the worker, practice, and expertise. She focused on four learning subsystems: the environmental interface, the action-reflection subsystem, the dissemination-diffusion subsystem, and the meaning-memory subsystem. In a similar vein, although she did not cite the 4I framework, Gherardi (2006) focused on "knowing in practice," which "signifies that knowledge is studied as a social process, human and material, aesthetic as well as emotive and ethical, and that knowledge is embedded in practice, as the domain where doing and knowing are one and the same" (2006: xii). Gherardi's attention to practice is similar to that of Casey's focus on activity. This focus on practice or activity ensures that the individual is not privileged in the theorizing. As Gherardi describes, "Giving priority to practices over individuals restores visibility to materiality and displaces mind and reason as the central phenomena of human life" (2006: xiv). Although Gherardi depicted OL with a set of premises that are not consistent with the 4I framework, they serve as a reminder of issues that can polarize perspectives on learning, knowing, and practice.

The question of location of learning (Easterby-Smith et al., 2000) is one that merits serious attention in a theory of OL. The 4I framework acknowledges the interconnectivity between levels of learning and suggests that learning resides within and across levels. A focus on practice or activity provides a somewhat different perspective since it links levels together through the activity. A theory of OL needs to account for these approaches. Our initial sense is that they are not in opposition. Rather, we envision a theory of OL across levels, like an accordion, in which we can compress the levels placing the practice or activity in the foreground of theorizing and the levels in the background. Or we can expand the levels and expose the multilevel relationships that hold the practice in place.

ADVANCING A THEORY OF OL

During the process of reflecting for this article, ideas emerged for a way forward. We see strong potential for the 4I framework to be enriched and strengthened by drawing from multilevel and evolutionary perspectives, which may ultimately result in a theory of OL. Okhuysen calls for building theory by combining multiple lenses, despite the challenge of this boundary spanning work. He notes that "we have a formidable opportunity in front of us to contribute to our field by taking down walls and building bridges between perspectives" (2011: 11). While page limitations do not allow us to develop comprehensive new theory here, we can lay the foundation to move things forward.

We concur with the following statement generally attributed to Einstein: "Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius—and a lot of courage—to move in the opposite direction." Einstein's challenge is relevant to OL theorizing. Returning to the tree metaphor, the image we have in mind is of a tree that can support many different branches on which there is a multiplicity of leaves. The leaves connect through their different branches back to the trunk. And the trunk is grounded in a root system that extends widely, thus ensuring a strong, stable base and providing nourishment for the entire system. If the leaves are not well connected to a branch, the trunk and the root system will not flourish and eventually will wither away. A trunk with insufficient branches and branches with insufficient leaves will not grow and develop. A theory of OL is more about a well-grounded trunk than it is about adding to the complexity of branches and leaves. Indeed, adding more branches and leaves creates the need for an even stronger and sustainable trunk and base to support them. We need a robust OL theory.

In large part progress in developing an OL theory has been impeded by lack of agreement on the ontological and epistemological basis for such a theory. The original 4I article did not directly address the basic assumptions we made about the nature of organizations and society. Burrell and Morgan (1979) argued that different assumptions about epistemology, ontology, human nature, and methodology lead social science researchers to operate in different

and, they contended, mutually exclusive, or incommensurate, paradigms. They asserted that "each paradigm generates theories and perspectives which are in fundamental opposition to those generated in other paradigms" (1979: viii). Although Burrell and Morgan's paradigm framework is widely known and accepted, not everyone agrees with the incommensurability of the paradigms. But most do agree that "different orientations have developed specific ways of answering the types of questions they pose and do not work terribly well in answering the questions of others" (Deetz, 1996: 204). Consequently, researchers working in one paradigm have difficulty communicating and having a productive dialogue with researchers employing another of the paradigms.

We believe the Burrell and Morgan 2 x 2 matrix, with its four paradigms, highlights a key problem in developing a comprehensive theory of OL. Each of the 4I processes of intuiting, interpreting, integrating, and institutionalizing makes different assumptions about organizations and society and operates within and across their different paradigms. Intuiting, as developed in the 4I framework, is about change, contradictions, unrealized possibilities, and the potential to envision and then create a new reality. A true intuitive insight cannot be driven by a positivist logic and rationale. It does not fit within the mental models currently held by members of the organization, nor does it fit with the established organizational rules and routines. It has never existed before, no data exist to assess it, and it is preempirical and therefore nonpositivist by its very nature. Intuiting is a highly subjective process. It therefore aligns with Burrell and Morgan's radical humanist quadrant.

Through the process of interpreting, the individual attempts to regularize what has been intuited—to put words and personal action to the insight and communicate it to others. This process crosses over into Burrell and Morgan's interpretive quadrant.

To integrate a novel idea, members of a group within an organization must take actions different from those they have taken in the past to begin to enact the innovation. Integrating a novel idea requires those members of the organization to ignore or work around prevailing organizational norms and existing rules and routines (i.e., structures). In this way integrating a novel insight crosses over into the radical structuralist quadrant and confronts the objective reality of the established organization.

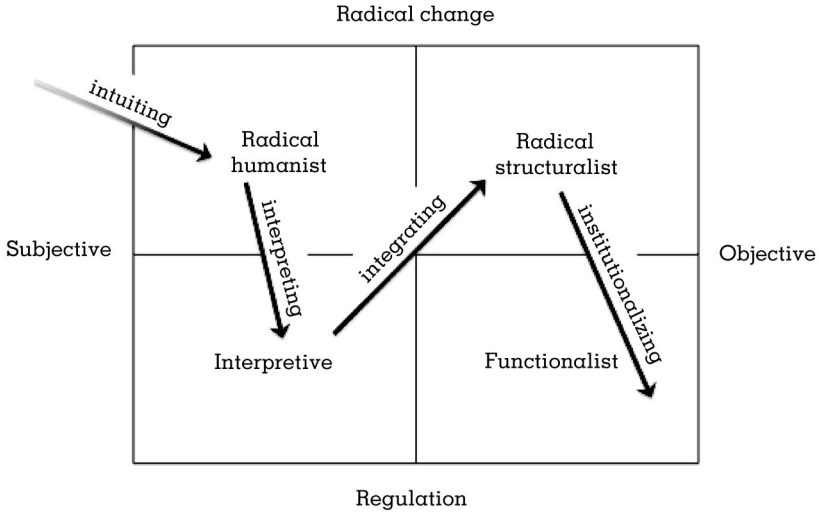
If the innovation persists, it becomes institutionalized. Modifications to norms, rules, routines, and structures institutionalize change within the organization. Institutionalizing a change makes it required and repeatable. As this occurs, the routines underlying those actions become more prevalent, more observable, more objective, and more real. Positivism can now be employed. This latter process takes the OL process into Burrell and Morgan's functionalist quadrant.

Figure 1 maps the 4Is onto the Burrell and Morgan paradigms. As the processes move through the individual, group, and organizational levels, there is also movement between the different paradigms. Indeed, the processes are much more about bridging the paradigms than about being within any one of them. Intuiting is about an individual changing the way he or she thinks and is able to perceive new possibilities. Interpreting is about sharing and stabilizing such insights through words and interaction among members of a group. When integrating, the members of the group, with their new, shared insight, confront the structures representing the established old order. If the innovation is successfully enacted and is to be sustained, those existing structures must be adjusted to accommodate the new way of doing things. This last step is the process of institutionalizing. Thus, the 4I framework spans Burrell and Morgan's four paradigms.

If the four processes of the 4I framework span the four quadrants of Burrell and Morgan's sociological paradigms, then it is not surprising that researchers exploring the different processes will employ different assumptions and have difficulty communicating with one another. As long as researchers subscribe to these seemingly mutually exclusive orientations, creating a common theory incorporating anything resembling the 4I processes is problematic.

There are two ways to address this problem. One could attempt to develop a theory of OL that fits more easily with one of the existing paradigms identified by Burrell and Morgan. However, we advocate against such an approach. It would lead to incomplete theory and further fragmentation of the field. Alternatively, we could move to an ontology and epistemology

FIGURE 1
4I Processes Mapped onto Burrell and Morgan's Paradigms



substantially different from the ones Burrell and Morgan employed yet more easily accommodating the 4I processes. Our bias is clearly for this latter option. We believe OL by its very nature transcends the paradigms defined by Burrell and Morgan and there is opportunity to integrate them. It is beyond the scope of this article to identify and assess the relative merits of alternative epistemologies and ontologies. However, we think that evolutionary epistemology, particularly the branch anticipated by Ashby (1956) and developed by Campbell (1974), Weick (1979), and others, holds promise as this alternative.

Evolutionary epistemology is also referred to as selection theory epistemology (Campbell, 1990a). This epistemology approaches the nominalism/realism dichotomy identified by Burrell and Morgan from a very different perspective. As Ruse explains:

> Here, the argument is that our knowledge is shaped or constrained by virtue of the fact that we humans—we knowers—are literally the products of evolution. Our instruments of knowing—ours senses, our brains, our linguistic abilities—were not put in place to give us a disinterested picture of reality, but to help us survive and reproduce (1990: 105).

What we know is the result of a variation-selection-retention process. This epistemology and the processes underling it apply not just at the level of the individual organism but also to social units at the group and organizational level (Cordes, Richerson, McElreath, & Strimling, 2008). Indeed, evolutionary epistemology, like evolution, is inherently multilevel (Campbell, 1990b). Evolution and learning may share the same underlying ontology. Aldrich hinted at this possibility when he observed:

> The organizational learning approach contains, in many respects, a parallel set of concepts and principles to those of the evolutionary approach. Although not made explicit in every article or book, the variation-selection-retention model is the foundation for analysis of learning in any context, whether by individuals, groups, or organizations (1999: 59).

Consistent with Aldrich's observation, we believe applying the evolutionary processes of variation-selection-retention within and across levels of analysis may provide the basis for a robust theory of OL.

Multilevel Specifications of the 4I Theory of OL

In addition to the ontological and epistemological issues, OL is a multilevel phenomenon that must satisfy the requirements of rigorous multilevel theory. Hence, the 4I theory of OL needs to build more explicitly on the key principles of multilevel research. To state this task in a highly simplified form, a well-specified multilevel theory of OL needs to answer *what, where, when, why,* and *why not* (Kozlowski & Klein, 2000: 12). For all of us building multilevel theory, we need to "strive towards complete models that

are system-oriented but do not try to capture the complexity of the entire system" (Kozlowski & Klein, 2000: 8).

The 4I framework satisfies many of the stated multilevel requirements; however, there are some requirements that merit further attention. The 4I framework provides a clear designation and definition of the theoretical phenomenon, OL, and the endogenous construct of interest, strategic renewal. Clarity around the endogenous variable is essential because it determines the levels, constructs, and linking processes a theory needs to address (Kozlowski & Klein, 2000: 12).

Model specification is fundamental, with many possible choices for multilevel models, such as direct effects, mixed determinants, mixed effects, moderator, frog pond, and homologous multilevel models (Kozlowski & Klein, 2000: 39). We propose that OL is a phenomenon that fits a homologous model, the purest type of the available multilevel models. Homologous models are powerful because of their compelling parsimony, yet they are rare. The efficacy-performance spiral proposed by Lindsley, Brass, and Thomas (1995), even though not tested empirically, offers an example of a well-defined homologous multilevel model.

> Given their generalizability across levels, homologous multilevel models are, at their best, uniquely powerful and parsimonious. At their worst, however, multilevel homologies may be trite . . . good ones have the potential to advance and unify our field, but weak ones offer little to our understanding of organizational phenomena (Kozlowski & Klein, 2000: 45).

The homologous model of OL features parallel constructs at each level of analysis and homologous linking processes to connect the individual, group, and organizational levels through intuiting, interpreting, integrating, and institutionalizing.

The 1999 framework did not explicitly state the type of emergence of OL in the sophisticated terminology around multilevel theory that is available today. Yet an explicit specification of the phenomenon's emergence is a central element of rigorous multilevel theorizing and is consistent with our original understanding and explanations. What does it mean when a higher-level phenomenon is emergent?

> A phenomenon is emergent when it originates in the cognition, affect, behaviors, or other characteristics of individuals, is amplified by their interactions, and manifest emergence of a higher-level phenomenon can range on a continuum from isomorphic composition to discontinuous compilation. As one moves along this continuum in search for the correct specification of the emergence, one moves from convergence of similar elemental contributors over pooled constrained, pooled unconstrained, minimum/maximum, variance to patterned compilation of dissimilar elemental contributors (Kozlowski & Klein, 2000: 56).

The emergence of OL is a bottom-up and interactive process (feedforward). Yet the emerged phenomenon at one level dynamically affects constructs and processes at lower levels of analysis (feedback). Bottom-up and top-down processes are dynamically related so that lower-level emergence is generally constrained by higher-level forces. The emergence of OL begins at the individual level of analysis with cognition, affect, and behavior as key elements of the individual's intuiting. Cognition, affect, and behavior contribute the "elemental content" or the "raw material of emergence" (Kozlowski & Klein, 2000: 55), which is combined at the group level when the elemental content of multiple individuals is combined during interpreting and integrating. This interaction generates the emergence of the phenomenon at the group level. Further interaction at the group level results in the culmination of emergence at the organization level.

We posit that OL emerges mostly through processes of compilation (Kozlowski & Klein, 2000), where dissimilar elements contribute in irregular and nonlinear ways to the phenomenon. In contrast, organizational phenomena, which are rooted in similar elemental content, are composed in a more linear and regular manner. While compositional emergence is theoretically possible for OL, it is unlikely to be the dominant form. It is more likely that OL emerges through a process of compilation based on the uniquely different elemental content of heterogeneous individuals who interact in irregular and unpredictable ways.

Conclusion

This retrospective prompted us to consider how the 1999 article has been utilized and whether a theory of OL has emerged. We discovered that while some of the subsequent research has added to the original work, the challenge of

developing an accepted OL theory remains unrealized. We have started to lay the foundation for future work building organizational theory from the ground up—with a view, to use our tree metaphor, of strengthening the trunk of the OL tree.

Our citation review indicated there has been and continues to be significant interest in the 4I framework, with new branches to the tree and many new leaves in the form of application. The citing articles that make conceptual contributions do so by elaborating and extending the 4I framework—complexifying, not simplifying. We concur with Corley and Gioia, (2011), who call on researchers in the field of organizational theory to focus efforts on insight that is more revelatory and nonobvious. We believe that developing a theory of OL by drawing on insights from evolutionary and multilevel theory may be a step in that direction.

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