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The Role of Organizational Learning in the Opportunity-Recognition Process

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Firms engage in entrepreneurship to increase performance through both strategic renewal and the creation of new venture opportunities. Organizational learning (OL) has become an effective avenue for strategic renewal. But what of creating venture opportunities—can OL enhance the process of recognizing and pursuing new ventures? This article argues that OL can strengthen a firm's ability to recognize opportunities and help equip them to effectively pursue new ventures. First, we identify three approaches to OL—behavioral, cognitive, and action. Then, we introduce a creativity-based model of opportunity recognition (OpR) that includes two phases—discovery and formation. Next, we show how each of the three types of learning is linked to the two phases of OpR. We suggest propositions that support our claim that OL enhances OpR and offer examples of firms that have used these organizational-learning approaches to more effectively recognize and pursue venture opportunities. These insights have important implications for entrepreneurial firms seeking to advance the venture-creation process.

Introduction

Firms often engage in entrepreneurship to strengthen performance and further growth through strategic renewal and the creation of new venture opportunities (Guth & Ginsberg, 1990; Stevenson & Jarillo, 1990). Recently, many firms have found that organizational learning (OL) can provide a major impetus for such efforts. That is, firms that implement organizational learning practices by configuring themselves to capitalize on the knowledge gained during the course of business have been able to leverage this newly learned knowledge to their strategic advantage (Lei, Slocum, & Pitts, 1999). Organizational learning, in some firms, has become a central component of strategic renewal (Davis & Botkin, 1994).

But what of the creation of new venture opportunities—can OL further that aspect of entrepreneurship? The discovery, evaluation, and exploitation of opportunities is a defining feature of entrepreneurship (Shane, 2003; Shane & Venkataraman, 2000) and the degree to which firms act entrepreneurially correlates with their ability to generate

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new products and services (Lumpkin & Dess, 1996). Although few have explored the links between OL and opportunity recognition (OpR), we believe that making those links can support the theory and practice of both fields. Organizational learning, for example, emphasizes improving practices and expanding into new arenas by creating new knowledge (Senge, 1990), building new understandings (Fiol & Lyles, 1985), and detecting and correcting misalignments (Argyris, 1990). These qualities may strengthen efforts to be more entrepreneurial. Moreover, the same attributes used to distinguish a learning organization—"an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights" (Garvin, 1993, p. 81)—are among the qualities needed to effectively recognize and pursue new venture opportunities.

This article argues that OL can enhance a firm's ability to recognize opportunities and equip them to effectively pursue new ventures. We begin by highlighting three distinct approaches to OL—behavioral learning, cognitive learning, and action learning—and we provide examples of firms that are using each of these learning approaches to be more entrepreneurial. Then, drawing on a model of OpR that was developed from the literatures of entrepreneurship (e.g., Shane & Venkataraman, 2000) and creativity (e.g., Csikszentmihalyi, 1996), we show how the processes of discovery and formation of new venture opportunities can be enhanced through OL. Each of the three types of learning links to a specific aspect of the opportunity-recognition process. Finally, we provide practical guidelines for how firms might promote new venture creation by implementing OL practices and procedures.

Organizational Learning: Three Related Themes

Organizational learning continues to be an important issue for all types of firms. Studies exploring the nature of knowledge creation, intellectual capital, and knowledge management have been on the rise, with recent papers being published for academics (e.g., Matusik & Hill, 1998; Nahapiet & Ghoshal, 1998; Nonaka, 1994), and for practitioners (e.g., Brown & Duguid, 1998; Fryer, 1999). Multiple frameworks and typologies have been used to define and describe OL (e.g., Huber, 1991; Shrivastava, 1983). Rather than reinvent these categorizations, we orient our discussion around two of the most common categories of OL—behavioral learning and cognitive learning. To these we add a third mode—action learning, which, although an aspect of cognitive learning, plays a particularly important role in the learning processes of new ventures (Lichtenstein, Lumpkin, & Shrader, 2003). These three modes of learning correspond to the broad categories of learning theories identified by Greeno, Collins, and Resnick (1996)—behavioral, cognitive, and situative, or action learning. In the three subsections that follow, behavioral, cognitive and action modes of learning will be briefly described.

Before proceeding, it is important to acknowledge that the processes that contribute to learning outcomes are complex, and they occur on multiple levels of analysis (Argyris & Schon, 1978; Low & MacMillan, 1988). Some scholars have distinguished between individual-, group-, and organizational-level qualities of OL, and suggested how they might interact (Crossan, Lane, & White, 1999; Nonaka, 1994). Different aspects of the opportunity-recognition process may also involve both individual and team-related activities (Singh, Hills, Hybels, & Lumpkin, 1999). In the context of OpR and OL, one can imagine numerous types of cross-level phenomenon. For example, a firm's efforts to integrate new knowledge might influence an individual's opportunity-recognition process, or an individual's entrepreneurial insights might evoke new learning at the team level.

We concur with entrepreneurship scholars who note that entrepreneurial processes are emergent and iterative, usually changing over time and often involving multiple layers of analysis (Davidsson & Wiklund, 2001). The relationships that we propose are very likely to involve cross-level interactions as well as multiple time frames, and such issues should be addressed when developing research questions and study designs. Although it is beyond the scope of this article, we acknowledge the importance of multiple levels of analysis in presenting our integration of the OL and OpR literature (e.g., Kim, 1993) but focus more directly on the relationship between OL and entrepreneurial OpR.

Behavioral Learning

Many of the classic ideas about OL are based on the assumption that organizations are goal-oriented, routine-based systems which respond to experience by repeating behaviors that have been successful and avoiding those that are not (Lundberg, 1995). This learning approach describes the acquisition, distribution, and storage of information and knowledge in a firm (Huber, 1991; Leavitt & March, 1988; Walsh & Ungson, 1991). In addition, it focuses on the adaptive learning concept that trial-and-error learning leads to routines and processes that confer selective advantage to the firm (Herriott, Levinthal, & March, 1985; Levinthal, 1991; Van de Ven & Polley, 1991). Because of the emphasis on learning from repeated behaviors, this perspective is often referred to as behavioral learning.

Behavioral learning focuses on the "antecedents and changes in organizational structures, technologies, routines, and systems as the organization responds to its own experience and that of other organizations" (Lundberg, 1995, p. 7). These theories argue that OL is an adaptive process and, thus, is triggered only by performance gaps or other signals of poor market performance (Cyert & March, 1963). In a similar way, because trial-and-error learning generates routines that tend to make an organization stable, it is only possible to spark major organizational change through significant externally-generated structural events. As such, behavioral learning is primarily incremental (Levinthal, 1991).

One good example of behavioral learning occurred in the entrepreneurial development of the Vanguard Group, a leading-edge mutual fund management firm (Siggelkow, 2002). The founder of the company had, based on his research of the fledgling industry in 1951, concluded that a low-cost strategy could pay off in the long term. This cost-cutting approach was a driving force for a variety of experiments John Bogle enacted in his tenure as CEO of the organization. For example, Bogle had learned from entrepreneurial experience that it is better to borrow than to buy resources (Stevenson & Gumpert, 1985). Prodded by unpredictable spikes in the volume of telephone calls, Bogle initiated a routine involving "borrowing" employees in which all employees could be made available to handle client telephone calls at any point. The program was called the "Swiss Army" because, like its namesake, it involved every existing employee, from clerical workers to the CEO. Bogle learned from experience that in order to insure that employees inexperienced in handling client issues would be well prepared for potential emergency situations, "each employee, from clerical workers to the CEO, had to perform several hours of phone service every month to stay in practice" (Siggelkow, 2002, p. 148). The program paid off during the stock market crash of 1987, during which virtually all Vanguard clients were served without a major glitch.

The Swiss Army was also adapted in a different form for the deployment of an updated IT system, in which an enhanced version of Vanguard.com's enterprise database program became the basis for external *and* internal communications and business processes throughout the company (Dragoon, 2003). This unique approach simplified

internal operations, increased customer service, and cut maintenance and upgrade costs for what were previously ten separate client/server systems. Further, through their repeated interactions with the Vanguard.com system, employees became experts in their own company web site, sparking learning that enhanced future versions. For example, although seemingly automated, the initial version of Vanguard.com required that on-line customer actions had to be printed out, processed by hand, and reentered by other employees. The problems that employees identified with this approach led them to develop new software objects that insured that information entered on-line by customers or employees went directly into the back-end system with no employee intervention. This behavioral learning has dramatically reduced re-keying errors and cut costs; presently, over 98% of all on-line customer interactions require no support from Vanguard employees (Dragoon, 2003).

Cognitive Learning

More recently, a perspective has emerged that focuses on the cognitive content of OL and how changes in individual's cognitive maps are aggregated and translated into changes in an organization's cognitive schema (Bartunek, 1984; Brown & Duguid, 1991; Kim, 1993; Nonaka, 1994; Weick & Roberts, 1993). Here, the focus is on the content of learning rather than on its behavioral outcomes, on processes that improve the creation of knowledge in a firm, and the utilization of knowledge to improve creativity, quality of interaction, and other types of performance (Fryer, 1999). By putting the right processes in place, a learning organization can, in essence, transform data into information, and information into knowledge, which can then be leveraged to generate organizational knowledge (Davis & Botkin, 1994; Kim, 1993). Organizational learning, in this sense, includes the process of exploiting externally-generated knowledge (Cohen & Levinthal, 1990) or transforming internally-stored knowledge (Garud & Nayyar, 1994) to increase the strategic assets of the firm. The assets in question are knowledge or "thought process" assets, so this perspective is referred to as cognitive learning.

Cognitive learning is related to the resource-based view of strategy because it holds that the very process of knowledge creation can generate unique organizational competencies and potential sources of competitive advantage. "Knowledge assets underpin competencies. . . . The firm's capacity to sense and seize opportunities, to reconfigure its knowledge assets, competencies, and complementary assets . . . all constitute its dynamic capabilities" (Teece, 1998, p. 64). As such, OL leads to an increase in the "organization's capacity to take effective action" (Kim, 1993, p. 43) as well as to the "mobilization of tacit knowledge held by individuals [that can] provide the forum for a 'spiral of knowledge' creation" (Nonaka, 1994, p. 34). Such learning, in turn, leads to greater firm effectiveness (Barney, 1991).

Examples of cognitive learning are evident at the origins of Starbucks Corporation, which was originated through a reconceptualization of the U.S. coffee industry by founder Howard Schultz. Based on his 1983 trip to Milan, Schultz recognized "an enormous opportunity for Starbucks to recreate the Italian coffee bar culture in the U.S." (Koehn, 2001, p. 8). The opportunity was to reframe coffee drinking into a social experience in America by providing a high-end product in a personalized environment to consumers wanting "affordable luxury" (Koehn, 2001). In this way, Schultz redefined the coffee industry in America, which, for more than the past 40 years, had been led by a few large companies competing on price and delivering a low-quality commodity that was meant to be made and consumed at home. By importing into his company the knowledge he gained from his (external) sources in Italy, Schultz developed a new framework for entre-

preneurial action that was composed of several strategic assets gained through cognitive learning.

One of the most important strategic assets at Starbucks involves Schultz's rethinking of the human resource side of the consumer-driven stores. Whereas servers are traditionally the lowest-paid employees in the restaurant industry, Schultz had learned that a "high-touch" personalized experience was the biggest motivator for customers, and this was only possible if all the front-end employees were able to lean the names and preferences of their frequent customers. Thus, Schultz reconceived Human Resources as a core component of his overall strategy, leading to a set of HR benefits that were previously unheard of in the industry. Not only are Starbucks' front-end employees the highest paid in the restaurant industry, Starbucks was the first to institute a benefits package for part-time employees, provide stock options for most of their workers, and offer a full week of paid training for every new member. The result: turnover at Starbucks is the lowest of any similar organization, and the high-touch experience translates into the strongest form of word-of-mouth publicity, thus obviating the need (and expense!) for local or national advertising. Further, as frontline employees are empowered to constantly suggest and implement new improvements, knowledge-creation has been institutionalized as an active and ongoing process within the company.

Action Learning

In contrast to the other two frameworks, action learning focuses on the moment-to-moment practice of correcting misalignments between "espoused theory" (what individuals or organization say they do) and its "theory-in-use" (what individuals or organizations actually do), to produce more effective action in real time (Argyris, 1990; Senge, Roberts, Ross, Smith, & Kleiner, 1994; Torbert, 1991). Action learning is primarily concerned with the patterns of belief and qualities of interaction between organizational members that facilitate (or constrain) the capabilities of the firm. Such learning is simultaneously personal and organizational, as it is built through a commitment to improve the integrity of individual action, as well as the alignment of activities within the organization (Schön, 1983; Torbert, 1973, 1991, 2000). When a group of individuals commit to an action-learning approach, a community of learning practice can be generated that may significantly impact the quality of communication, innovation, and team performance in a firm (Senge et al., 1994). According to this approach, learning happens in "real time," through a nearly simultaneous reframing of personal belief and action that can transform the individual as well as the organization (Torbert, 1991). Thus, this perspective is referred to as action learning.

Among the insights that have arisen through the research–practice of action learning is the distinction between "single-loop" incremental learning and "double-loop" transformative learning (Argyris & Schon, 1978; Bartunek, 1984; Bateson, 1972). In single-loop learning, incremental modifications are made to organizational behaviors that improve the *efficiency* of organizing. Double-loop learning, by contrast, challenges the context within which such actions are being done, by continuously asking whether the organization and its members are pursuing the right actions that might lead to the appropriate goals (Torbert, 1991). Asking this type of reflective question requires a willingness to uncover hidden assumptions and face uncomfortable feelings (Argyris, 1990). Developing this awareness is a key goal of action learning, for it allows individuals and organizations to break through defensive routines that keep people from producing their best work, which can impact all areas of organizational life (Argyris & Schon, 1978).

The on-line reframing activity of action learning is often focused on operating beliefs and interaction patterns that refer to cognitive schema of organizational leaders, which explains why action learning is a type of cognitive learning. However rather than the external focus of cognitive learning—toward the creation of firm-level resources and organizational knowledge, action learning has a more inward focus—toward the patterns of belief and action of key organizational members and their interpersonal relationships. In this way, action learning is "situative" in nature (see Corbett's analysis of Experiential Learning Theory in this issue), for its foundations are individuals–situated (e.g., personal and contextual) experiences with others. A key outcome of action learning can be a mutual commitment to new "rules of engagement" in an organization, thus creating a culture of more transparency, openness, and decisiveness.

A good example of action learning occurred in a start-up software company that was struggling to gain a second round of venture capital (Torbert & Associates, 2004, Chapter 9). Although successful in releasing innovative products, the executives recognized that without a breakthrough in sales, the organization would never receive more capital and would soon collapse. Knowing that a transformation was necessary, they hired a consultant who was himself experienced in the action learning method, to lead a one-day management retreat, ostensibly to frame a new company strategy and handle some persistent organizational problems.

After interviewing the two founders and the other two executive team members, the consultant recognized that the underlying problem was an entrenched pattern of interaction between the two founders, caused by a misalignment between the "equality" they both espoused versus the differences in power they actually enacted on a day-to-day basis. Seeking to disrupt this pattern, the consultant persuaded the founders—the CEO and Vice President of Development—to switch roles for the day. He further altered the firm's "rules of engagement" by limiting the retreat to just the two founders, pushing them to redefine their roles and carefully examine their ongoing patterns of interaction.

These unexpected and risky moves triggered significant shifts in the founders' perceptions, communications, and interactions. The next day, they reached written agreement on six major organizational changes, including a significant strategic decision to focus on only one of their multiple products, and the demotion of the Vice President of Sales to a role subordinate to the Vice President of Marketing—a shift that the Sales VP unexpectedly welcomed with relief. Within a month, all six changes were implemented; two months later the company introduced—six months ahead of schedule—their newest product, which was designed to capitalize on a major untapped market opportunity. Sales revenues quickly outpaced costs for the first time in the company's history. Moreover, several months after the initial experiment, the two founders decided to switch positions permanently, and in so doing, triggered even more openness within the company culture, as well as improved overall strategic capability. In these ways, action learning transformed the perceptions and actions of both founders, who enacted their learning through an entirely new operating approach that transformed the company as a whole.

These three modes—behavioral learning, cognitive learning, and action learning—provide a framework for understanding how entrepreneurial organizations may learn. We recognize that these three modes are not permanent within individuals, groups, or ventures; indeed, much of the action learning perspective is dedicated to supporting entrepreneurs, venture teams, and whole organizations to become more adept at cognitive and behavioral learning (Senge et al., 1994). Thus, over time, an individual or a venture may become more adept at cognitive, behavioral, or action learning. The evidence showing increases over time of behavioral and cognitive learning is mainly based on simulations (e.g., Carley, 1999) or case studies (e.g., Lichtenstein & Brush, 2001). Empirical research

also shows that individuals and organizations can successfully gain expertise in action learning (Torbert, 1991; Torbert & Associates, 2004).

Moreover, these modes are not strictly independent; we have presented them as "ideal types" for the sake of clarity only. Learning theorists have shown that the presence of one mode can support the presence of the other modes. In addition, the theoretical separation of behavioral and cognitive learning may only be an artifact of the empirical research process that requires operational distinctions between these closely related concepts. Indeed, as we suggested in the section on action learning, some theorists argue that these two qualities of learning are deeply intertwined and cannot be practically separated (e.g., McElroy, 2002; Sarasvathy, 2001). As one of our reviewers put it, "Common sense suggests that learning is a continual reflexive cycle of action–cognition–behavior."

Indeed, it is the interconnectedness of these learning approaches that helps explain how OL supports the key entrepreneurial process of OpR. As the model that we will introduce in the next section suggests, OpR is a recursive process that involves different types of activity over multiple levels of analysis. Learning in a given context is also likely to involve more than one type of process. As a result, firms and individuals that are sincerely attempting to learn—as we suggest they are when engaged in an OpR process—are likely to use different learning styles. Therefore, it is our general contention that individuals and firms engaged in behavioral learning are more likely to practice cognitive learning as well, and vice versa. This may be particularly true with action learning as mentioned above, which can create the context within which the other modes of learning are encouraged.

To make the link between OL and OpR, we turn next to a model for understanding the process by which individuals and organizations recognize and capitalize on entrepreneurial opportunities.

A Creativity-based Model of Entrepreneurial Opportunity Recognition

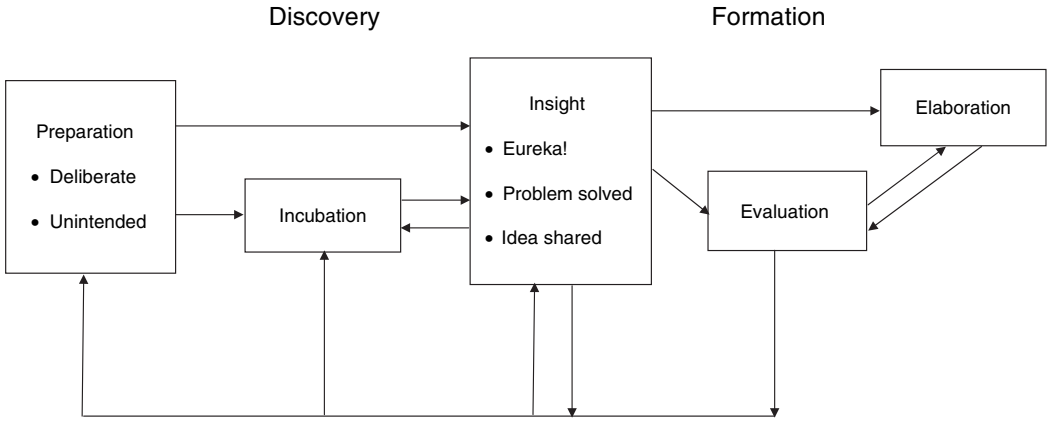
Opportunity recognition—one of the central ideas of entrepreneurship—is the ability to identify a good idea and transform it into a business concept that adds value and generates revenues. Bygrave and Hofer (1991) define an entrepreneur as "one who recognizes an opportunity and creates an organization to pursue it." Shane and Venkataraman (2000) argued that the discovery, evaluation, and exploitation of opportunities is a defining feature of the field of entrepreneurship.

Recently, a model of the OpR process has been proposed that builds on the idea of discovery and evaluation (Hills, Shrader, & Lumpkin, 1999; Lumpkin, Hills, & Shrader, 2004). Based on a classic psychological theory of creativity (Csikszentmihalyi, 1996; Wallas, 1926), the model depicts OpR as a staged process that involves a discovery phase consisting of preparation, incubation, and insight, and a Formation phase consisting of evaluation and elaboration (see Figure 1). A key feature of this general model of OpR is its recursive nature. Opportunity recognition is not limited to a singular "Aha" experience; it is an iterative process through which insights are contemplated, new information is collected and considered, and knowledge is created over time. In this way an idea for a business must be formed into an opportunity that adds value to the firm (Timmons, 1994).

A creativity-based model of OpR is well suited for entrepreneurial OpR for several reasons. First, entrepreneurship is an emergent process especially at its earliest stages. The recursive nature of creativity parallels the back-and-forth activities that entrepreneurs often engage in when trying to grasp an emerging business concept (Gartner, Bird, &

Figure 1

Creativity-based Model of Entrepreneurial Opportunity Recognition*



*Based on Lumpkin, Hills, & Shrader, 2004; Hills, Shrader, & Lumpkin, 1999.

Starr, 1992; Sarasvathy, 2001). Second, the model is distinguished from other models of creativity in the organization literature because it is used principally to describe an individual-level activity whereas other creativity-based approaches typically address the use of group-level creativity techniques in the context of established organizations (e.g., Amabile, 1988; Woodman, Sawyer, & Griffin, 1993).

After a summary of the five stages of OpR, we show how the three modes of OL—behavioral, cognitive, and action—are linked to the discovery and formation phases of the OpR process.

Five Stages of Opportunity Recognition

Several scholars have endeavored to characterize the OpR process (e.g., Fiet, 2002; Shane, 2000; 2003). Some OpR models depict opportunity recognition as a staged process (e.g. Bhave, 1994) where the outcome of the process is defined as "recognition" (Christensen, Masden, & Peterson, 1989). Most scholarly attempts to model OpR have characterized it as the confluence of many factors such as the background of the entrepreneur and the influence of the business and general environment (Gaglio & Taub, 1992; Long & McMullan, 1984). In a synthesis of these perspectives, Hills et al. (1999) and Lumpkin et al. (2004) proposed a model suggesting that a "stages of creativity" framework (Csikszentmihalyi, 1996; Wallas, 1926) provides the necessary elements for modeling OpR. These stages include: (1) preparation; (2) incubation; (3) insight, which form the discovery phase; (4) evaluation; and (5) elaboration, which constitute the formation phase. In the subsections that follow, each of these five elements is discussed in terms of how it relates to the opportunity-recognition process.

Preparation. Previous research suggests that preparation and prior knowledge are essential to the opportunity-recognition process (e.g., Shane, 2000). Preparation refers to the experience and knowledge that precedes the opportunity-discovery process (Kao, 1989). Such preparation is typically a conscious effort to develop expertise in a domain and

develop a sensitivity to the issues and problems in a field of interest (Csikszentmihalyi, 1996). But preparation also includes knowledge and experience that is gathered unintentionally, that is, without aiming to discover opportunities. In an organizational setting, the ideas that result in successful venturing often emerge incrementally from the firm's background, current line of product or services, or technological knowledge. However, individuals may bring new ideas and skills to a firm that result in new ventures.

Incubation. Incubation refers to the part of the opportunity-recognition process in which entrepreneurs or an entrepreneurial team contemplates an idea or a specific problem. It does not, however, refer to conscious problem-solving or systematic analysis. Rather, Csikszentmihalyi argues that during incubation, "ideas churn around below the threshold of consciousness" (1996, p. 79). Thus, incubation is typically an intuitive, nondirectional style of considering various possibilities or options. Gaglio and Taub (1992) described incubation as the period when the "pre-recognition stew" is "simmering." It is the part of the OpR process in which the new combinations that Schumpeter (1934) envisioned might emerge (Ward, 2004).

Insight. Insight refers to the "eureka" moment or "aha" experience. Whereas incubation refers to an ongoing process, insight refers to a moment of recognition (Csikszentmihalyi, 1996). In many cases, it is the point at which a whole answer or core solution springs into awareness suddenly and unexpectedly. This sudden convergence is the result of a cognitive shift that breaks existing means–ends relationships (Gaglio & Katz, 2001). Insights may provide sweeping catalysts to new venture creation or uncover incremental knowledge that advances an ongoing discovery process. It is unlikely that an insight is a singular "event"; insights often occur recursively throughout the OpR process (de Koning, 1999). Entrepreneurial insights typically consist of either the sudden recognition of a business opportunity, the solution to a well-considered problem, or the acquisition of an idea from colleagues, friends, or other associates.

Evaluation. Evaluation signals the start of the second phase of the opportunity-recognition process—formation. It involves analyzing whether concepts developed in the discovery phase are workable, whether the entrepreneur/team has the necessary skills to accomplish it, and whether it is truly a novel enough idea to pursue. In the context of entrepreneurial OpR, evaluation may involve feasibility analysis wherein ideas are put to the test via various forms of investigation such as preliminary market testing, financial viability analysis and/or feedback from business associates and others in one's social network (Bhave, 1994; Singh et al., 1999). Evaluation also involves an internal process in which the entrepreneur(s) must question the prospects for the new insight and ask, "Is the business concept sufficiently valuable and worthwhile to pursue?" (Csikszentmihalyi, 1996).

Elaboration. In the context of entrepreneurial creativity, elaboration involves "capturing value from the creative act" (Kao, 1989, p. 17). In contrast to the confidence-seeking aspects of evaluation, elaboration involves legitimacy seeking: forming the business into a viable opportunity by subjecting it to external scrutiny and building its support system. Elaboration is typically the most time-consuming part of the process since it represents the relatively more tedious work of selecting options, finalizing choices, and organizing resources (Csikszentmihalyi, 1996). Assuming the business idea is still considered viable after the evaluation process, elaboration may involve detailed planning activities to reduce uncertainty. The elaboration process itself, however, often reveals aspects of the

business concept that need attention or more careful analysis and thus may result in further evaluation (Aldrich, 1999).

The process of OpR outlined by these five stages can be advanced by applying the principles and practices of OL. In the remainder of the article, we describe how that might be achieved. Next, we turn to how OL can enhance the opportunity-recognition process.

Three Modes of Organizational Learning in Entrepreneurial Opportunity Recognition

A quote from the OL literature (Garvin, 1993) suggests the close link between OpR and OL:

> New ideas are essential if learning is to take place. Sometimes they are created de novo through flashes of insight or creativity; at other times they arrive from outside the organization or are communicated by knowledgeable insiders. Whatever their source, they are a trigger for organizational improvement. (Garvin, 1993, p. 81)

Garvin's statement is one of many that demonstrates how the qualities valued by learning organizations are similar to the elements of the opportunity-recognition process. In particular, OpR involves the conversion of information into knowledge: ideas are generated and evaluated for their quality and viability in the same way that information is analyzed and combined to create knowledge (Nonaka, 1994). Framed in this way, the opportunity-recognition process may be viewed as an example or type of OL. In a formal sense, OL is the ongoing process of acquiring and interpreting information that leads to the creation of new knowledge (Brown & Duguid, 1998; Davis & Botkin, 1994; Galunic & Rodan, 1998; Huber, 1991; Van de Ven & Polley). Similarly, the activity of acquiring and interpreting information is at the heart of the opportunity-recognition process, and the result of both endeavors is an increase in knowledge and value to the firm. Just as the creative process involves the generation of new knowledge and new forms of expression, entrepreneurial OpR is a learning process that initiates the creation of new wealth (Corbett, 2002; Dimov, 2003).

This perspective leads to the primary argument in this article—that the principles and practices of OL can strengthen the opportunity-recognition process. Given this premise, we now extend our argument by showing how the three related approaches to learning (behavioral, cognitive, and action) link to the two phases of the OpR process (discovery and formation) (Lumpkin et al., 2004). Specifically, the shifts in mental constructs that occur in cognitive learning are indicative of the discovery phase of OpR; behavioral learning is expressed in the evaluation and elaboration aspects of formation in OpR; and action learning, in its ability to challenge underlying assumptions in a recursive way, creates a contextual openness that supports both the discovery and formation phases of OpR.

Cognitive Learning in the Discovery Phase

As described above, cognitive learning focuses on one's internal frameworks for knowing—what have been called "cognitive schema"—and on how those frameworks can be transferred to others and leveraged to improve personal and organizational action (Kim, 1993). Through these mental processes and the creative conflicts they can engender, new information and knowledge is created; this is the essence of cognitive learning

(Nonaka, 1988, 1994). This mode of OL is dependent on individuals' ability to identify and change their pattern of cognitive associations, and share those changes with others (Brown & Duguid, 1991).

The transformation of mental models that occurs in cognitive learning is roughly analogous to the discovery phase of OpR. Cognitive learning happens in OpR when acquired knowledge shifts an entrepreneur's cognitive map such that understanding or interpretation of events changes (Daft & Weick, 1984). Essentially, cognitive learning enhances an individual's or an organization's ability to (re)create information and knowledge, opening new opportunities for interpretation and action (Nonaka, 1994). Sometimes involving "entrepreneurial intuition" (Crossan et al., 1999), this process is likely to exist in a climate of opportunity search and problem solving such as may be found in the discovery phase of OpR. In this phase, innovative new combinations may occur because of a heightened need to discover new ideas (Schumpeter, 1934; March, 1991). Such conditions invoke entrepreneurs "to make these novel connections, perceive new or emergent relationships, and discern possibilities that have not been identified previously" (Crossan et al., 1999, p. 526). Cognitive insight may involve a reframing or synthesizing of resources already accessible to the individual or company, resulting in a transformation of preexisting ideas or assets that generate new knowledge (Garud & Nayyar, 1994) and create new firms (Petzinger, 1999).

Just as cognitive learning can enhance strategic assets (Teece, 1998), the discovery phase of OpR can be the basis for new strategic options and avenues for competition, or recombinations of resources that result in the creation of new ventures (Brush, Green, & Hart, 2001; Fiet, 2002) or expand the value of existing firms (Galunic & Rodan, 1998). As an entrepreneur draws on his/her experience and expertise, letting the problem or issue at hand incubate and develop internally, the emergent concept—whether a new product idea or an expanded service offering—can become the basis for an entirely new strategic direction in the firm (Quinn, 1992; Mintzberg, 1994). For these reasons, we make the following proposal:

> **Proposition 1:** The more that entrepreneurial firms engage in cognitive learning processes, the more effective they will be in the discovery phase of opportunity recognition.

Behavioral Learning in the Formation Phase

As mentioned above, the behavioral mode of OL focuses on the tangible outcomes of learning-by-doing, which learning theorists have addressed from two perspectives. One describes how organizations use existing information in order to compare current situations with situations from the past and situations in other environments (Leavitt & March, 1988; Walsh & Ungson, 1991). In this approach, knowledge resources can be utilized only to the extent that they can be classified and stored in the organization (Huber, 1991). Thus, many of the recent forms of "knowledge management" are driven by the utilization of information technology, which becomes a driver of behavioral learning modes (KPMG, 1998; IBM Group, 1999). The second approach in behavioral learning focuses on trial-and-error adaptability, through which learning-by-experience becomes embodied in the form of specific routines, systems and processes (Feldman & Pentland, 2003) as well as unexpected advances in organizing new ventures (Gartner, Bird, & Starr, 1992; Sarasvathy, 2001). Theoretically, behavioral routines provide consistency and replicability to the firm, increasing its chances for long-term survival (Nelson & Winter, 1982). At the same time, the performance and improvement of routines can lead to organizational change, expanding the potential for learning (Feldman, 2000).

These two perspectives highlight how behavioral learning is essential to the formation phase of OpR. In the formation phase, evaluation and elaboration processes help develop a business concept into an opportunity. First, evaluation involves distributing information to stakeholders in order to determine if the business concept is feasible (Fryer, 1999). This leads to a series of analyses and experiments that formally explore whether and how the opportunity is viable for this specific entrepreneur and/or venture. As the new opportunity is organized and elaborated, a side result is a more responsive entrepreneurial process (Sarasvathy, 2001), and/or a more adaptive, evolutionarily adept organization (Aldrich, 1999). The adaptive quality of learning is initiated primarily by specific, tangible incidents within the firm, such as performance gaps or other signals of poor market performance (Cyert & March, 1963).

Opportunity recognition often has similar causes—a desire to generate something new or the need to solve a problem that is affecting the competitive quality of the firm. Additionally, the process of behavioral learning is usually incremental and iterative, involving a constant cycling between the internal development of routines and their preliminary effectiveness in the environment, often generating innovation and entrepreneurial change (Feldman & Pentland, 2003). Likewise, entrepreneurial OpR is an iterative process, and because each stage can feed back on the others, the overall framework occurs in an incremental way. Thus, we propose:

> **Proposition 2:** The more that entrepreneurial firms engage in behavioral learning processes, the more effective they will be in the Formation phase of opportunity recognition.

Action Learning across Both Phases of Opportunity Recognition

Action learning approaches involve the practice of correcting misalignments between expectations and reality in order to generate more effective organizational behavior in real time (Argyris, 1990; Senge, Roberts, Ross, Smith, & Kleiner, 1994). The reflective and personal nature of action learning makes it less common than the other two forms; at the same time, by challenging long-held patterns of belief and behavior, it can rapidly transform an executive's ability to communicate and to develop effective strategic competencies, Such competencies include the ability to engage in double-loop learning (Argyris & Schon, 1978; Roach & Bednar, 1997) which goes beyond the single-loop improvements in efficiency to double-loop explorations about the very nature of an organization's design and strategy (Senge, Roberts, Ross, Smith, & Kleiner, 1994).

Action learning creates a context for both the discovery and formation phases of entrepreneurial OpR in combination. Asking the reflective questions that are at the heart of action learning requires a personal willingness to uncover one's hidden assumptions, and thus face the discomfort of recognizing that one's espoused theory may be different than one's theory-in-use in the organization (Argyris, 1990). Developing such an awareness that leads to a realignment of belief and behavior allows entrepreneurs and their teams to break through defensive routines that keep people from producing their best work (Argyris & Schon, 1978; Torbert & Associates, 2004). As such, the openness that action learning offers can itself become a competitive advantage by creating more opportunities for creative thinking, innovation, and productive interaction.

This context of openness also connects the two phases of OpR. On the one hand, the double-looped nature of action learning operates at a cognitive level, offering tools for questioning and reframing longstanding beliefs and attitudes. Insofar as these cognitive models block the emergence of a new insight or recombination, action learning supports the discovery phase of OpR. At the same time, action learning happens in "real time,"

that is, in the interactive process of enacting ongoing activities, solving conflicts and adapting to new circumstances in an ongoing way. "This kind of cooperative inquiry occurs in real time with partners also committed to integrating action and inquiry" (Torbert, 2000, p. 79). As such, double-loop learning becomes an essential tool for successfully implementing a new insight, and thus it supports the Formation phase of OpR. Finally, action learning is based on an ongoing iterative process of reflection and action that can be used to tie together and create synergies between both the discovery and the formation phases of OpR. Therefore:

> **Proposition 3:** The more that entrepreneurial firms engage in action learning processes, the more effective they will be in encouraging both the discovery and formation phases of opportunity recognition.

In the next section, we provide tangible suggestions and examples of how entrepreneurial firms can use each of these three modes of OL in order to improve their efforts at OpR.

The Role of Organizational Learning in Opportunity Recognition

The OpR model describes opportunity recognition as a form of creativity that can result in organizational innovation and the identification of new venture opportunities. In the previous section, we proposed that these outcomes can be strengthened by OL. Although the way we have linked venture creation and OL is unique, our approach is, in some ways, parallel to the literature that has connected individual creativity with organizational innovation through the rubric of learning and action (e.g., Amabile, Conti, Coon, Lazenby, & Herron, 1996; Crossan et al., 1999; Dougherty, 1992; Feldman & Pentland, 2003; Glynn, Lant, & Milliken, 1994; Nonaka, 1994; Nonaka & Takeuchi, 1995). We now draw on that literature to extend our argument, by proposing that the more elements of creativity and innovation a venture or firm expresses—that is, the higher or more intense its capacity for organizational innovation—the more opportunities it may identify (Petzinger, 1999; cf. Barringer & Bluedorn, 1999). Thus, in a practical way, the more of the three modes of learning that a firm or an entrepreneur can enact, the more likely that new opportunities will be recognized that can be leveraged for strategic advantage. Following our three-fold categorization of learning, we next provide examples that show how each mode of learning can increase innovation, creativity, and the identification of new opportunities.

Recognizing Opportunities through Cognitive Learning

As described above, cognitive learning involves changes in individual and/or organizational patterns of cognition, and shifts in the way knowledge is transferred within the organizational system (Glynn et al., 1994). To the extent that these changes generate new products or open up new markets, cognitive learning is a source of OpR for new venture creation. In most cases, cognitive learning in entrepreneurial companies occurs as a type of transformational capacity (Garud & Nayyar, 1994), that is, the ability to redefine the meaning or value of currently existing ideas or resources into a new economic opportunity for the firm. This redefinition can occur in at least two ways: through a transformation of currently existing resources into new products, or through a reinterpretation of internal processes such that more information and knowledge can be generated.

Cognitive learning is exemplified by two employees at Patterson Fan Company who created an unusual-looking grill out of spare parts from the industrial fans being manu-

factured in the South Carolina plant (Rosenwein, 2001). By cognitively reframing the use (meaning) of the flared fan parts, these industrious employees developed a unique design that allowed for greater heat circulation while maintaining cooler unit temperatures than standard grills. Chief executive officer Vance Patterson patented the grill in his name and the names of the two inventors, and the spin-off company—Down South, Inc.—represents a new opportunity in the form of a unique product in a new market for the corporation. In this way, cognitive learning in product design and the creation of a new organization led to new opportunities for the venture.

Recognizing Opportunities through Behavioral Learning

Behavioral learning is primarily adaptive, focusing on the modification of routines and structures in the face of experience. "The classic prediction is that success yields stability in routine functioning, while failure produces change" (Glynn et al., 1994, p. 46). Yet as Feldman (2000) shows, routines may be more mutable than previously thought. Similarly, one of the benefits of newness is flexibility, the capacity to change direction by altering even core properties of the organization (Lichtenstein, 2000). In this sense, behavioral learning can spark new opportunities for new ventures in at least two ways—through modifications of routines that create unexpected extensions to a firm's offerings, and through an ongoing stream of organization-wide adaptations that can lead to unexpected synergies and marketable solutions.

The story of Philadelphia Pharmacy exemplifies how a serendipitous change in routines can generate unexpected strategic opportunities (Petzinger, 1999, pp. 11–14). One day, its founder, Leon Ost, found an assistant writing out a prescription by hand, rather than using the computer-generated labeling system. To his surprise, Ost found that the assistant was writing the personalized label in Spanish, as she often did for the neighborhood's Hispanic population. Rather than berating her for circumventing standard operating procedures, Ost leveraged this knowledge into a change in routines by translating every computer-generated prescription into Spanish, thus opening up the market for a huge local clientele. Then, following a rapid influx of Vietnamese residents into the neighborhood, he added a third language to the computer program. These adaptive actions brought him even more recognition, and within a few years, Philadelphia Pharmacy was doing four times more business per square foot than the average American drugstore. In this way, incremental adaptations can result in the creation of new opportunities through expanded markets and more valuable product offerings.

Recognizing Opportunities through Action Learning

The third mode of change, action learning, creates the potential for new opportunities by transforming the context within which new ideas can emerge. By focusing on the underlying norms of the organization and questioning whether the rules of engagement are appropriate, action learning can create a culture of openness, effectiveness, and creativity (Argyris, 1990). This broadening awareness can increase individuals' connection between espoused theory and theory-in-use (Schön, 1983), setting up conditions for increased discovery and more refined evaluation and enactment of ideas.

The first outcome of action learning—agreeing to new rules of engagement that free individuals to speak honestly and act with fewer defenses—can transform an organization's ability to innovate and excel. Such a second-order transformation was enacted in The Natural Step, an entrepreneurial organization that has significantly advanced the

movement toward environmental sustainability in Sweden, and, more recently, in the United States (Bradbury & Clair, 1999). The organization's CEO wanted to develop scientific guidelines for sustainability that could be understood by non-scientists and applied in business. However, given the prevailing industrial-age assumption that environmental and economic gains are mutually exclusive (Hawken, 1993; Shrivastava, 1995), he recognized that conventional decision-making approaches would be inappropriate. Instead he enacted a double-loop action learning model, "a form of thinking that goes beyond solution-seeking to reconceive the very foundation of one's problem, such that entirely new solutions may emerge" (Bradbury & Clair, 1999, p. 72n17).

Through a highly iterative process of collaborative dialogue, a consensus document emerged that was endorsed by 50 of the top scientists in Sweden, and, at the same time, was clearly understandable to public figures in education, politics, and business. Soon a network of business leaders and others, encouraged by the king of Sweden, provided funding to disseminate the colorful booklet and audiotape to the entire population of Sweden (7 million households). In addition, several of the supporting businesses including IKEA, Scandic Hotels, and Electrolux have led the country in developing highly innovative products that are ecologically sustainable and commercially successful (Bradbury & Clair, 1999). By shifting the rules of engagement, a learning-based context was generated that secured the organizational success of The Natural Step and, at the same time, transformed the society in which the organization exists.

In summary, each of these modes of learning—cognitive, behavioral, and action—have been successfully utilized to create new and unexpected opportunities with great success. Table 1 summarizes the ways in which these modes can be integrated into venture creation activities and how each one can open up the potential for OpR. In these ways,

Table 1

Modes of Learning That Generate Opportunities in Entrepreneurial Firms

	Nature of entrepreneurial learning	Elements affected by entrepreneurial learning processes	Potential opportunities for entrepreneurial learning
Cognitive	Identify and alter cognitive patterns, generate new opportunities for knowledge and action (Nonaka, 1994; Crossan, Lane, & White, 1999)	Existing and potential knowledge Existing and potential resources Systemic processes	Design new products/services Develop new ways of doing business Attract/retain customers Apply proprietary knowledge in unique/ innovative ways
Behavioral	Alter tangible processes through experience (Feldman & Pentland, 2003) Determine feasibility through trial-and-error learning (Sarasvathy, 2001)	Existing and emerging routines Adaptive processes	Streamline processes to achieve new efficiencies Integrate learned experience to improve tangible processes
Action	Transform the context by questioning assumptions and aligning espoused belief with actual practice (Argyris, 1990; Torbert, 1991)	Underlying norms and beliefs Interaction, "Rules of Engagement"	Accelerate innovation processes Generate highly productive and creative organizations and collaborations

OL can increase the capacity for entrepreneurial firms to discover and form new economic opportunities.

Conclusion

A firm's learning processes include its commitment to learning, the structural processes that contribute to or detract from learning, the quality of learning processes, and the rate at which new learning is applied to organizational processes. Each of these has important strategic implications in terms of how effectively a firm can add value and thus achieve or sustain a competitive advantage (Moingeon & Edmonson, 1996; Teece, 1998). Similarly, entrepreneurial firms can be successful to the degree that they identify, evaluate, and enact strategic opportunities. Thus, OpR, like OL, has important implications for how firms create wealth by converting entrepreneurial insights into strategic advantage. In this article, we have argued that OL can enhance the opportunity-recognition process.

We have attempted to show how the features of a creativity-based entrepreneurial opportunity-recognition model (Hills, Shrader, & Lumpkin, 1999; Lumpkin et al., 2004) support the premise that OL can enhance the opportunity-recognition process. First, like cognitive learning, OpR is advanced through the conversion of information into knowledge, such that what starts as tacit knowing can be reframed into a realizable possibility in the market. Second, like behavioral learning, OpR involves adaptation and change. That is, once an insight has emerged out of an entrepreneur's "pre-recognition" stew, that idea undergoes a great deal of analysis and testing, each aspect of which changes (and hopefully improves) the original conception. Finally, like action learning, OpR relies on a willingness to suspend assumptions and reframe current expectations, while, at the same time, submitting one's emerging conceptualization (mental model) to a series of tests to see how well aligned it is to the reality of the situation.

In a sense, then, the success of an OpR process will depend on the ability of individuals and organizations to learn through all phases of the process. If this is true, then each mode of learning should be useful for increasing the viability of OpR, and for improving the results of creative problem solving in the creation of new ventures—whether new firms or new products/services. This logic leads to our final set of propositions:

Proposition 4a: The more organizational learning practices that are enacted by entrepreneurs, the higher the likelihood that new opportunities will be recognized.
Proposition 4b: The more organizational learning practices that are enacted by entrepreneurial firms, the higher the likelihood that new opportunities will be recognized.

It is important to note that in proposing these relationships, we make no assumptions about an individual or firm's alertness (Kirzner, 1979) or entrepreneurial "competence" (Fiet, 2002) as some prior research has emphasized. Such factors may affect the type of learning processes that are used or the likelihood that entrepreneurial opportunities will be recognized. Similarly, an entrepreneur's biases (Busenitz & Barney, 1997) or path-dependent routines (Gavetti & Levinthal, 2000; Siggelkow, 2002) may also influence the relationship between learning activities and OpR. We view these potentially important influences as primarily contextual—elements to be specified or controlled for in future research into the role of organization learning in the opportunity-recognition process.

Indeed, the concepts presented here and the limitations of the present study have important implications that can fruitfully be addressed in future research. First, the wealth of scholarship and research that has been pursued in order to understand the OL process

can be brought to bear on the opportunity-recognition process. That is, insights from learning research may provide new insights into OpR.

The converse may also be true. The opportunity-recognition process provides an ideal context for studying OL. In fact, OpR can be thought of as a situation where learning occurs in a heightened state. As mentioned above, the entrepreneur or entrepreneurial team seeking answers to a problem or seeking to actualize a business insight is likely to be trying to learn what is valid and useful as quickly as possible. Thus, it can be argued that the OpR process is an "extreme" example of learning. This presents a particularly salient area for research, in the same way that Karl Weick and his colleagues have expanded our knowledge of OL through the study of critical situations like fighting forest fires and being on the flight deck of an active aircraft carrier (Weick & Roberts, 1993). In a similar way, the opportunity-recognition process may represent a heightened state of learning where researchers may be able to observe a "fully engaged" learning process.

Linking OL to an OpR model that is creativity-based suggests another avenue for future research, namely, the relationship between OL and creativity. For example, research by Getzels and Csikszentmihalyi (1976) indicates that "problem finding" abilities may be more important to understanding creativity than problem solving. Problem finding involves the way problems are formulated when a gap or deficiency in knowledge is detected. Entrepreneurs with a strong urge to find problems as they evaluate ideas and form them into opportunities may have a greater ability to discern which opportunities are valid. Creativity research also suggests that question-asking and information-obtaining behaviors affect creative outcomes (Glover, 1979). Gathering information and posing questions is also central to the learning process and future research may find that studying OpR provides a means to understand the creative dimensions of learning.

Finally, new ventures offer fertile ground for the best practices that are emerging from the organization learning and opportunity-recognition research to take root and grow. Chances for both short-term survival and long-term success, we believe, will be enhanced if entrepreneurial firms adopt OL practices. The ability to recognize opportunities may provide a key advantage by which established firms can remain viable and competitive in ever-changing environments. Future research should expand on these insights and endeavor to empirically test how learning methods might best be integrated into venture creation and growth processes so that OpR and other learning processes become essential elements of an organization's strategy and culture. Our hope is that by providing these perceptions, we will support entrepreneurs and their firms to generate more opportunities and enact them in ways that expand the capabilities of their organizations and themselves.

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