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International Entrepreneurship and Capability Development—Qualitative Evidence and Future Research Directions

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In this article, we explore how new capabilities emerge and solidify in new ventures that are faced with fundamental uncertainty from their environment. To do so, we draw from the organizational and entrepreneurial literature on cognition and capabilities. Using initial qualitative evidence from a multifirm study in the context of new venture internationalization, we develop a cognition-based model of capability emergence in new ventures. Our findings extend the capability development and learning implications of internationalization to the fundamental character of organizing processes in start-ups. Moreover, we derive avenues for future entrepreneurship research on the origins and evolution of capabilities in new ventures.

An important strand of entrepreneurship research—that of international entrepreneurship—has induced renewed interest in the role of organizational capabilities on firm performance (Autio, Sapienza, & Almeida, 2000; Bingham, 2009; Keupp & Gassmann, 2009; Knight & Cavusgil, 2004; Sapienza, Autio, George, & Zahra, 2006). Several interesting and counterintuitive conclusions have already been suggested that highlight differences between entrepreneurial and more mature firms; notable among these findings is the relationship between capabilities and firm performance. Whereas the literature on organizational capabilities tends to emphasize the importance of well-formed capabilities for firm performance, entrepreneurship scholars suggest that the absence of well-formed capabilities may be a source of entrepreneurial advantage, particularly in new and rapidly changing environments (Sapienza et al.; Sine, Mitsuhashi, & Kirsch, 2006). Though inspiring, the literatures of international entrepreneurship and organizational capabilities remain largely silent when it comes to the study of capability emergence in entrepreneurial firms. In particular, micro-level studies on this phenomenon have been lacking. In this article, we address this gap by using the context of new venture

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internationalization as the lens through which we highlight the dynamics of capability development in entrepreneurial firms. In addition to contributing an inductive case study on entrepreneurial capability development, we seek to outline a broader research agenda for the study of organizational capabilities in entrepreneurship.

A central theme in organizational and entrepreneurial studies concerns the ability of firms to respond to uncertainty through endogenous strategic and structural adaptation by developing and deploying capabilities (Gavetti, 2005; Levinthal, 2000; McMullen & Shepherd, 2006). Capabilities refer to a firm's capacity to purposefully deploy a combination of resources and processes to achieve a desired goal (Amit & Schoemaker, 1993). Often referred to as routines or repetitive patterns of task-oriented actions involving multiple actors (Nelson & Winter, 1982; Winter, 2003), these processes emphasize action-based mechanisms for organizational adaptation. Under this logic, both new and established organizations draw on existing routines developed in prior environments and initiate task-focused actions to execute specific tasks.

Building on these arguments, the entrepreneurship literature on capability formation in start-ups focuses on how prior experiences constitute the source and foundation of new ventures' capabilities (Helfat & Lieberman, 2002; Mosakowski, 1998). Founders import routines they know from previous professional roles, where these routines are either re-used directly, or modified and recombined through behavioral adaption, and ultimately congeal to form the organizational capabilities of the start-up (Helfat & Peteraf, 2003). However, this approach falls short of explaining how new ventures develop and deploy *new* capabilities that transcend imported routines rather than be circumscribed by them (Zahra, Sapienza, & Davidsson, 2006).

An adaptation logic to new capability creation in entrepreneurial firms is problematic for two reasons. First, the direct re-use of routines originating from the founders' professional past will often be restricted because actions precipitated by such routines reflect the business logic of the environment for which they were conceived. When previously developed routines are inappropriate or even nonexisting, the probity of routines-based explanations for capability development is diminished (Gavetti & Levinthal, 2000) and cognitive explanations may be more appropriate (Gavetti, 2005; Grégoire, Barr, & Shepherd, 2010). Second, in unknown environments, behavioral adaptation of existing routines may be insufficient to form new capabilities. Still, even recent literature on capability emergence and solidification in start-ups (e.g., Bingham, 2009; Bingham, Eisenhardt, & Furr, 2007) has emphasized the role of reconfiguration of existing processes rather than the creation of *de novo* ones. Again, an adaptation-focused logic may be only poorly suited to understanding the nascence of routines in radically different environments.

Consequently, while much is known about behavioral adaptation in situations where either an explicit or tacitly shared business logic exists to guide a firm's process-based adaptation, the creation and interplay of cognitive understandings, goal specification, and task-focused organizational actions remains an unexplored area (see, e.g., Grégoire, Barr et al., 2010). In short, received literature fails to explain how new ventures develop and deploy new capabilities when faced with fundamentally new situations. In this study, we present qualitative evidence on uncertainty-driven cognition and capability development in the context of new venture internationalization. In so doing, our objective is to generate new theoretical insights on what drives start-ups to develop new capabilities and provide avenues for further research in this area.

The rich literature on organizational and managerial cognition provides an alternative lens to organizational adaptation (Barr, Stimpert, & Huff, 1992; Gavetti, 2005; March & Simon, 1958; Weick & Bougon, 1986) and capability emergence. This literature emphasizes the role of cognitive processes and sensemaking centered on perceived

causation as the key regulator of organizational actions and subsequent routine development. The routines that underlie firms' capabilities can also have emergent properties in their own right, as organizational agents mindfully modify activities to achieve ends and execute tasks that their experience suggests are valuable (Gavetti & Levinthal, 2000). Opposed to the action-based approach that sees automated, repetitive responses to environmental stimuli as the origin of organizational capabilities, in the cognition-based view, these emerge through interplay between cognition (i.e., perceptions of valuable goals and appropriate means to pursue them) and behavioral routines.

A focus on routines alone has contributed to a gap in our understanding of how cognition of purpose-oriented business logic is initially formed, how initial preroutines for achieving identified goals are created, and how the interplay between cognitive understandings and goal-oriented action create a platform for subsequent capability development. Even though studies invoking a capability lens tend to emphasize the reconfiguring of routines to enable adaptation (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997), it remains unclear how, at a micro level, emergent causal understandings and probing actions enable firms to withstand high uncertainty arising from changing exogenous pressures and how this interplay provides a platform for capability development.

Therefore, explaining how processes underlying capabilities are created, modified, or combined can add to causal theories of organizational adaptation and strategic change (Barr et al., 1992). This is particularly true for the entrepreneurship literature, where a cognitive perspective emphasizing mental processes such as sensemaking from which value-creating behavior emerges is still largely underrepresented (Grégoire, Corbett, & McMullen, 2010; Mitchell et al., 2007). Whereas current research emphasizes the effects of uncertainty-based cognition on entrepreneurial behavior in general (Haynie, Shepherd, Mosakowski, & Earley, 2010; McKelvie, Haynie, & Gustavsson, 2010), an explanation of how uncertainty-based cognition influences the development and deployment of new capabilities in start-ups is yet missing.

To develop initial insights on capability development under uncertainty, we needed a setting that had a high uncertainty where existing routines could not easily traverse. Hence, we explored the factors influencing the development of new capabilities in a field study of high-tech start-ups that expand their operations into foreign markets. We focused on the causal processes by which capabilities emerge during international market entry, rather than the content of these capabilities. Fundamentally, internationalization is a process that is executed under conditions of high *situational uncertainty*. While different definitions and interpretations of uncertainty exist in the entrepreneurship literature, we refer specifically to the work of Alvarez and Barney (2005) and to the work of McMullen and Shepherd (2006). Alvarez and Barney describe an investment decision into a market opportunity as uncertain "when the possible outcomes of this decision and the probability of those outcomes are not known when a decision is made" (p. 778)—reflective of the definition of Knightian uncertainty. McMullen and Shepherd, based on Milliken's (1987) seminal article, extend this Knightian view by pointing out that it is agnostic of entrepreneurial discovery and conceptualize how the perceived level of uncertainty and the willingness to bear uncertainty may impact entrepreneurial action. Specifically regarding the level of uncertainty, different information shortages experienced by entrepreneurial actors in seemingly identical situations will explain why they may still be subject to varying levels of uncertainty (McMullen & Shepherd; Milliken).[1]

1. For example, prior experience gained from exposure to a similar setting might reduce uncertainty in the focal situation (Alvarez & Barney, 2005)—independent of the level of uncertainty experience in any of the

Following these arguments, we define situational uncertainty as the combination of firm-specific, context-dependent ambiguity, variability, and complexity of institutional, product, and market conditions where the new venture's appropriate course of action is not immediately apparent—prompting researchers to offer capability-based explanations for the performance of internationalizing firms (Delios & Beamish, 2001). The visibility and multiplicity in international entry processes and their outcomes present an appropriate sample to examine issues underlying capability development (McDougall, Shane, & Oviatt, 1994; Sapienza et al., 2006).

The situational uncertainty associated with internationalization created multiple opportunities for the firms in our sample to learn from their international exposure, as some enacted organizational processes that yielded successful outcomes while others failed. These heterogeneous experiences triggered two distinct outcomes. First, start-ups developed a robust set of organizing processes through repeated exposure to varying intensities of situational uncertainty. When faced with multiple different contexts with similar underlying drivers of situational uncertainty (*repeated uncertainty*), as well as varying degrees of ambiguity, variability, and complexity (*intensity of uncertainty*), start-ups responded by developing new or modified organizing processes or by discarding existing ones. By "organizing processes," we refer to the sets of activities related to entering a new market, establishing a business infrastructure, and devising and initiating transactions to buy, sell, or manufacture a product or service in a foreign market. As the start-ups' exposure to situational uncertainty varied in terms of repetition and intensity, they also differed in the *diversity* in their repertoire of organizing processes developed as a response, as well as in terms of their *dexterity* in executing these processes. Therefore, the heterogeneity of learning experiences not only fostered the multiplicity of organizing processes (i.e., increased diversity) but also made these start-ups more adept at executing these processes (i.e., increased dexterity).

Second, these start-ups developed a cognitive map of cause–effect relationships between specific processes and their outcomes (which we term *transparency*), and an understanding of the timing and selection of specific processes to deploy in combination with others in response to varying institutional or market conditions (termed *percipience*). We refer to the capacity to combine the vocabulary of processes and the holistic comprehension of their interdependencies as the *language of organizing*. We found that start-ups developed their own language of organizing, with varying degrees of success, by building a rich repertoire of processes and a shared cognition of what and when to deploy these processes to enact a dynamic adaptation to their environment.

The contribution of this study is threefold. First, this study provides a window into the factors influencing new capability formation in start-ups, addressing a void in our understanding of the importance of capabilities in entrepreneurial firms. The opacity of the capabilities concept, in definition and measurement, confounds both the capabilities and the entrepreneurship literature, as the notion of repetitive routines is incongruous with common beliefs about the practice of entrepreneurship. For instance, founders tend to perceive their activities as improvisations or idiosyncratic acts of connecting opportunities to resources (Aldrich, 1999; Baker, Miner, & Eesley, 2003) rather than repetitive behavior. Our study reveals that it is not only the improvising nature of actions, but also the awareness of the repertoire of organizing activities and a comprehension of their combinations that likely yields successful outcomes. We found two important moderators of the

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two situations. See also our definitions of "repeated uncertainty" and "intensity of uncertainty" subsequently.

link between situational uncertainty and formation of new capabilities, namely, resource fungibility and shared experiences of managers. Resource fungibility (the ability to shift them to alternate uses) increased the formation of new capabilities by enhancing the multiplicity of possible process combinations, whereas shared experiences retarded the formation of new capabilities by discouraging the generation of new customized solutions for international entry.

Second, this study elaborates upon the causal logic of the influence of learning to explain the formation and deployment of capabilities. While a substantial body of organizational learning research exists, only recently has there been an emphasis on learning from success and failure experiences (Corbett, Neck, & DeTienne, 2007; Haunschild & Sullivan, 2002; Kim & Miner, 2007; Miner, Bassoff, & Moorman, 2001; Miner, Kim, Holzinger, & Haunschild, 1999). The findings add to the rich dialogue on the impact of learning on firm behavior by clarifying the complex mechanisms by which heterogeneity in success and failure experiences influence the emergence of capabilities. In particular, we highlight the importance of cognition in the formation of new capabilities, showing that the repeated exposure to situational uncertainty compelled the firm to expand both its set of organizing processes and its awareness of the cause–effect relationships among them. In so doing, the start-up developed a deeper understanding of its repertoire of responses to exogenous stimuli and developed an idiosyncratic language of organizing (Aldrich, 1999; Baker et al., 2003).

Third, we propose an agenda for future research to advance the entrepreneurship literature in the area of capability emergence and establishment. Our findings point toward three domains in this field of research that will greatly benefit from additional scrutiny. First, the literature is unclear about the role of internal versus external triggers for capability development. Second, future research could increasingly look toward the role of individuals and the imprints they may leave in firms and how these, in turn, affect capability emergence. Finally, for the international entrepreneurship literature, we suggest avenues for future research that adopt cognition and capability-based lenses to examine drivers of successful internationalization.

Method

We conducted a longitudinal field study using multiple case studies as our primary source of empirical evidence. We took several steps to ensure appropriate sampling and adequate variance in market entry capabilities. First, we selected firms that commenced their international operations within the previous 5 years to minimize validity issues related to recall bias. This effectively translated into internationalization as an event that occurred within 5 years of start-up formation. Second, this sample allowed us to obtain detailed information on changes in knowledge and learning from new markets as each entry had a perceptible impact on the firm and was vivid in the entrepreneur and management team's memory. Third, as most of our start-ups belonged to the ICT sector, differences in actions were less likely to be induced solely by differences in technology or customer profile, simplifying interpretation and increasing our confidence regarding the causes of variation in our observations. Fourth, because firms may differ in their capability development based on entry mode choices (Barkema & Vermeulen, 1998; Zahra, Ireland, & Hitt, 2000), we selected start-ups representing both direct (e.g., direct sales, subsidiary) and indirect (e.g., agent, reseller) foreign market entry mechanisms. Fifth, we selected start-ups with variance in geographical markets entered, as such variance may affect learning through internationalization efforts. Finally, our sample represented varying

levels of success with internationalization efforts. A brief description of our sample is provided in Table 1.

Our sample consists of 10 Finnish firms that expanded globally early in their life. We selected this sample using secondary sources including the local (Helsinki) technology council, industry association data, and company websites. This information was further used to narrow the interviewee list and as background information to prepare for the initial interviews. Eight of these firms are start-ups that operate in the ICT sector. Two more firms (EXCEL,[2] ROLL) were not classified as start-ups as they had been in existence more than 8 years when we began our data collection. Yet, as these firms commenced their international operations within the previous 5-year window, we used them as a comparison group to improve generalizability.

Interview Process

We adopted a semistructured process that facilitated a free expression of the entrepreneur's ideas and allowed us to compare responses across subsequent interviews and draw lessons. With at least one of the authors present, interviews were conducted by two or three (typically three) individuals, increasing our confidence in the reliability of interpretation. Our initial interview with each start-up was attended by two or more interviewees to alleviate concerns of source and recall bias (Denzin & Lincoln, 1998). In most cases, the founder was accompanied by members of the management team responsible for either operations or international markets. Other team members present were encouraged to correct facts pertaining to the interviews such as timing or outcomes but not why certain events transpired. This technique helped ascertain the facts of each case but allowed freedom in causal attributions. Follow-on interviews were conducted with either one or two team members present. Overall, we collected data from 41 semistructured interviews that ranged from 30 to 90 minutes each, for a total of approximately 70 hours, all of which was recorded and transcribed. We conducted our first set of interviews in Fall 2002 and follow-up interviews at 6- to 9-month intervals with the last set of interviews in Fall 2004, and we followed them subsequently to track survival outcomes. All entrepreneurs spoke English; when comments were made in Finnish, these were translated. Subsequently, the interviewers independently assessed transcripts and prepared notes that were reconciled to provide a comprehensive interpretation of interviewees' comments.

To avoid errors arising from halo effects and other interpretation biases (Strauss & Corbin, 1998), the transcribed notes were used by a subset of team members (including at least one team member not present at the interviews) to establish a preliminary framework. We followed an iterative process of marking quotes and concepts on note cards, systematically arranging these cards into themes and concepts across interviews, and reviewing our notes to identify patterns or themes across interviewees. This process was based on well-established norms of inductive research (Lee, 1999). The method provided a comprehensive description of the underlying processes involved and helped us develop a framework of capability formation during internationalization.

Identifying and Operationalizing a "Capability"

Following prior studies, we looked for firm's development and deployment of organizational capabilities specific to foreign market entry (Autio et al., 2000; McDougall &

2. We created pseudonyms for each company to obscure their identity.

Table 1

Descriptions of Firms

Company	Employees	Brief description	Comments
CASH	12	CASH is a mobile/web-enabled corporate treasury management services that help multinational firms manage their foreign exchange treasury transactions in a coordinated manner. Founded in 2000, it has offices in two countries and is expanding to other sites.	Rapid expansion and then trying to get traction in markets. Global customer base makes it difficult to co-locate offices.
CHART	70	CHART sells mobile applications that enhance data collection in clinical research and development. Founded in 2000, it has offices in five countries. Only direct sales techniques are used.	Direct sales from offices to proximate markets. Often projects are conducted in countries other than where sale occurs.
EXCEL	800	EXCEL sells project management software for corporations. Founded in 1983, the firm has had three internationalization phases. The first two internationalization phases (1986–1994) were minor. EXCEL went public and executed an aggressive international acquisition strategy (1999–2003). Currently the company has subsidiaries in nine countries.	Around 10 acquisitions failed to materialize. This is the only publicly traded firm in our sample of technology ventures.
GAME	40	GAME sells mobile games. The end customers are consumers and they are reached primarily through mobile operators and secondarily through media companies. Sales to the end-user interface are primarily through direct sales in Europe, and through agents and resellers outside Europe. The company was founded in 2000.	In Europe, the initial reseller strategy changed to direct sales.
HELLO	20	HELLO sells mobile customer relationship management software to application service providers. Founded in 2000 with operations in four countries, HELLO has physical office space in two of those countries. Resellers are used in some markets.	Two offices closed. Sales position terminated and entry mode changed to selling through existing sales channels.
ROLL	12	ROLL has a patented system for the paper manufacturing industry. The company helps manufacturers design their production system to be compact and efficient. Founded in 1993, ROLL has had several international clients but has one office located in the United States.	Clients are dispersed in Germany, France, Sweden, and the United States. Work is more project-driven with different size and duration of projects.
SNOW	25	SNOW is a pioneering weather service information provider through multiple information channels. Founded in 1996, SNOW started with only the Finnish market and then expanded to other Scandinavian markets.	The entrepreneur is a woman who is successful with a grow–consolidate–grow strategy in a competitive E.U. market.
SPOT	20	SPOT sells a positioning technology for Wi-Fi. Founded in 2000, SPOT has an office in the United States and a sales representative in Hong Kong. The firm has sold through its websites to several countries.	Virtual offices: 2 Internet domains: about 20 One virtual office upgraded to a front office.
STAR	15	STAR sells mobile office applications. The end customers are companies, but sales are handled through mobile operators, to whom STAR sells directly. It has an active partnering strategy that offers its technology in combination with partner applications. Founded in 2000, the company operates primarily in the European market.	Intended to establish a subsidiary but backed out and never completed the move.
TUNES	34	TUNES is a leading producer of streaming video for mobile technologies. Founded in 1996, TUNES internationalized by seeking out mobile service providers as partners to enable revenue generation through value-added mobile services.	In 1999, TUNES went through a significant turnaround process and revamped and refocused its business aggressively as an international player.

Oviatt, 1996; Zahra et al., 2000). However, whereas prior studies frequently assume a *deliberate intent* to develop a capability and a *planned outcome* to capture the effectiveness of deployment, we did not assign *a priori* intent as a condition to develop a capability, as firms may develop capabilities accidentally or without a cogent sequence of preplanned actions (George, 2005a), especially in international contexts where situational uncertainty may be high. In addition, we faced challenges in operationalizing capabilities using existing, routine-based definitions (Winter, 2003). We were cognizant of the possibility that international market entry activities may not be repeated in the same form, and therefore might fail to meet this definition. Although our data revealed some repetition, a substantive subset were not repeated, even when outcomes were successful, indicating that the execution of activities may have depended upon the start-up's cognitive model of cause–effect relationships.

Therefore, we adopted a working definition of a capability as a *combination or sequence of processes and its enabling resource commitments that have the potential to reliably achieve outputs congruent with organizational goals*. While a process could also be a routine, a routine did not have to be present in order to be recorded as a notable process. Using this broader lens, we were able to observe new, ancillary, modified, and nonrepetitive processes that might be built into a capability. Also, we inferred that a start-up's use of a variety of processes in a variety of combinations or sequences implied that it: (1) has a repertoire of processes, such that not all processes are used at all times or in the same sequence, yet may still be constituent elements of a capability; and (2) has a comprehension or belief about which processes can be effectively deployed to attain a desired outcome.

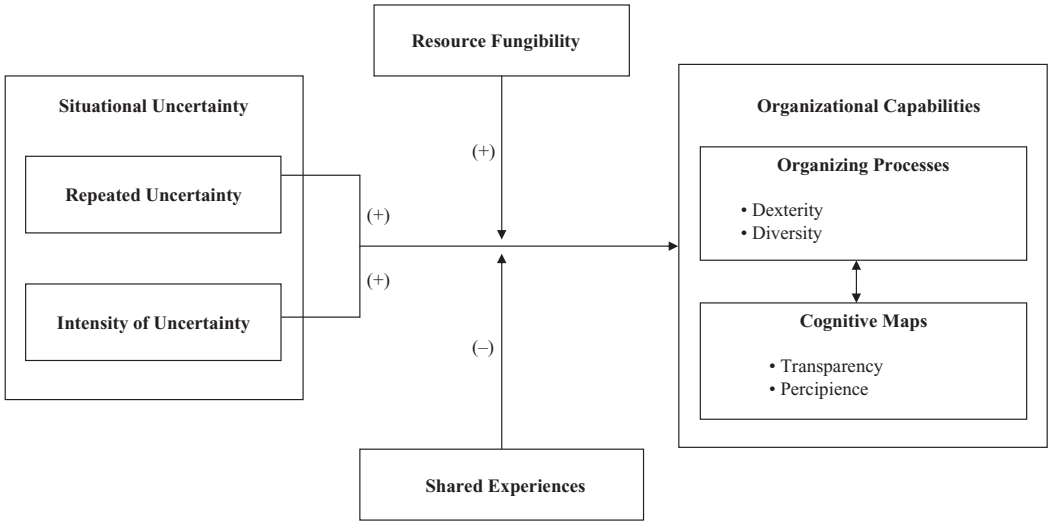
Organizing Processes and Cognitive Maps

We found two constituent elements of a capability—a set of organizing processes and a cognitive map to aid decision making on which process to deploy when and in what sequence. The cognitive map allows for variations of the subset of activities that comprise each individual process (Barr et al., 1992; Bogner & Barr, 2000). For example, CHART's sales strategy used a variety of marketing approaches (from cold calling to organized marketing and sales visits) that it adjusted in each country that it entered. Not only did the firm have variants within the sales process, but it also timed the sequence of activities involved, for example, when to establish its local subsidiary or partner relative to launching its sales strategy. In one case, CHART found a partner and then began a variant of its sales process. In another, it began its sales processes and then set up a local office. This example shows why we prefer an inclusive definition of capability as a combination or sequence of processes that allows for redundancy among choice of alternative processes and sequential variations of tasks within each process.

From our data, it became evident that capability development, while triggered by international entries, was not necessarily contextually determined. The start-ups developed capabilities that were not constrained to managing individual foreign market entries, nor were the outcomes of those capabilities necessarily manifested in any single market context alone. Rather, the organizing processes and related cognitive comprehension developed during the entries appeared to be migratory in application and mutable in structure, that is, the applications could migrate to multiple product or market contexts rather than being embedded or applied solely in international entry. Thus, through internationalization, the start-ups developed a broader understanding of the processes

Figure 1

Framework of Factors Influencing the Development and Deployment of Capabilities



constituting their business, facilitating the development of new capabilities both specific and unrelated to international market entry.

In Figure 1, we introduce our overall findings on factors influencing the development of organizational capabilities. Two specific attributes of situational uncertainty, namely the intensity and repetition of uncertainty, influenced the formation of the two components of a capability (i.e., organizing processes and cognitive maps). We found that resource fungibility had a positive moderating effect on the formation of capabilities. Shared experiences of founders drawn from an organization where they worked together *prior* to formation of the start-up negatively moderated the formation of capabilities. We elaborate upon these findings below.

Influence of Situational Uncertainty on the Repertoire of Organizing Processes

Our sample consisted of single-business firms that, during international market entry, attempted to create or invoke a set of suitable organizational processes to achieve a defined set of business goals. With each market entry, they confronted multiple sources of uncertainty concerning products; institutional factors (Delios & Henisz, 2003); organizational structures (Delios & Henisz); resource access (Anand & Singh, 1997); and consumer needs (Johanson & Vahlne, 1977). These created a variety of challenges as start-ups tried to meet their objectives, eliciting a variety of responses and opportunities to learn from their experiences.

There were two important attributes of situational uncertainty that influenced the generation of new organizing processes and the formation of a cognitive map: the extent of uncertainty repetition and the intensity of the situational uncertainty to which the firm was exposed, where uncertainty repetition captures the number of times the start-up

experiences situational uncertainty of a similar kind,[3] and intensity captures the cognitive distance of the focal firm to the level of ambiguity, variability, and complexity presented by the respective setting (see Alvarez & Barney, 2005; McMullen & Shepherd, 2006). These two attributes of uncertainty influenced both the diversity of organizing processes and the dexterity with which they were executed. The comment of a chief executive officer (CEO) [CASH] captured it well:

> We've had a lot of problems, most of them not significant, but there have been a lot of them . . . always we have been able to come up with a solution.

Similarly, the managers of HELLO believed that their contacts from prior work in three countries would lead to faster sales in these countries, but the outcome did not conform to these expectations. Instead, HELLO had to change its processes to reach customers in foreign markets.

> We were optimistic because we had existing customer contacts in all three countries, so we naturally said that the best way to get pilots is to go through existing contacts. We [. . .] anticipated it would take a maximum of 6 months but instead it took a year . . . we were used to selling something that was already a mature market, then we discovered something new and said "Hey, why don't you try this out?" [. . .] So, looking back we were a little bit too optimistic at that time but our response was pretty immediate.

Our data were indicative of learning from each entry experience as manifested in the identification of and experimenting with new ways to organize the business, or in the adaptation of existing processes and resources. This observation is consistent with Miner et al. (2001), who found that situational uncertainty influenced the degree to which product development teams improvised on their actions and deviated from existing routines. For instance, both CHART and STAR had radically new products and needed to develop new creative processes to approach the customers and convince them of the merits of the new product.

We found that repeated exposure to situational uncertainty allowed the firms to experiment with variations in the sequence of processes. Learning when certain processes could be deployed were outcomes of success and failure experiences gained from similar forms of uncertainty encountered in prior entries. Therefore, repeated exposure to uncertainty set in motion the generation of a diverse set of processes *and* the concomitant ability to recombine pieces of processes to form a new one that was more likely to work in the current scenario. Because each market entry revealed a unique set of uncertainties, experiencing these over time improved the start-up's dexterity at executing individual processes and (re)combinations of previously devised ones. This observation is consistent with other studies that linked deftness in execution to competence development (McGrath, MacMillan, & Venkataraman, 1995). For example, the CEO of HELLO noted that, as each market entry tended to be unique, it was incumbent on managers to develop skills for integrating processes for entering new markets:

> The pieces are made in different places. It is quite a learning process that you can reach the point where different pieces are [developed] in different parts of the world. You learn to document, you learn to share work, and above everything, [you learn] to test. There is a shared tool, shared documentation, and communication procedures by

3. Uncertainty repetition captures the number of times that a firm is exposed to similar situational uncertainty (usually in varying contexts) and *not* the number of times that a firm is exposed exactly to the same situation.

> which people discuss with each other . . . that make it more effective. So we are able to bring together these pieces of knowledge and make it work in a new market.

We observed that at high levels of situational uncertainty, the enacted processes were not necessarily tightly linked to the problem at hand. In these cases, even though the entrepreneurial team could not decide on the right action sequence and might adopt inappropriate strategic actions that resulted in operational setbacks, the trial-and-error learning outcome was later integrated into their repertoire of organizing processes. For example, TUNES, a first mover and a leader in streaming video and mobile marketing, was caught up in the Internet frenzy and overestimated the revenue-generating potential of foreign markets. Given uncertainty about the foreign market potential, the start-up made investments and resource commitments that could not be supported with the minimal revenues that it had generated initially. Concurrently, the high intensity of uncertainty regarding the evolving industry structure compelled the firm to also modify its organizing processes and reshape its business model. The CEO [TUNES] commented:

> [The foreign markets] are evolving quarter by quarter and the value chains or value webs are changing and naturally that was something that we didn't even think that we could predict . . . that is an operative change because all the time in the media industry you have to look at who is doing what and what is really the value chain, who buys the software, who utilizes it, etc. . . . and then you change . . . you change what you do and how you do it.

This and other comments helped improve our own understanding of capability development mechanisms. When the intensity of situational uncertainty was high, the start-ups sought to forge sense-making routines that enabled them to compare and comprehend experiences across market environments as well as derive an appropriate sequence for deploying these processes, corresponding to the establishment of "simple rules" (Eisenhardt & Sull, 2001). In contrast, ROLL operates in the paper industry; a mature market that is relatively stable and with few product or market uncertainties. ROLL enacted a simple sequence of activities for a new market entry. Here, each entry was consistent with the prior entry and with very few new processes and limited variations in the sequence of these processes. Though ROLL had a capability associated with executing successful entries, it neither expanded nor fine-tuned its set of organizing processes nor did it change its cognitive map associated with these processes.

Some scholars have observed a need to derive a clearer understanding of capability development in uncertain environments, especially regarding the relationship between strategy, capabilities, and performance (Eisenhardt & Martin, 2000). Our empirical context provides an interesting window on these phenomena. As the firms in our sample entered a new foreign market, the social, cultural, and institutional context of their business changed fundamentally, rendering re-use or behavioral adaptation of existing processes a suboptimal strategic choice. This created a tension between variance (in terms of institutional contexts) and convergence (in terms of what the firms were attempting to do), a tension which shaped the process of learning and capability development. During each international entry, various aspects of the start-ups' business models were challenged, prompting these companies to reconsider their own processes.

Thus, the intensity and repetition of situational uncertainty from international entries exposed the start-ups to multiple challenges that triggered idiosyncratic responses by each start-up, wherein new processes were generated and, in some cases, existing processes were modified to fit the changing decision-making context. The repetition of situational uncertainty dramatically influenced the *diversity* of the start-ups' toolkit of organizing

processes and influenced, to a lesser extent, the *dexterity* in executing each process. Still, the intensity of situational uncertainty challenged these start-ups to increase the diversity of their organizing processes by extending or recombining existing processes rather than devising new ones from scratch. The higher the intensity of situational uncertainty, the more dexterity the start-ups showed in executing existing processes and in piecing together reliable processes. Generally, they did not enact completely new processes in highly uncertain environments. Therefore, we posit that:

Proposition 1: Repeated exposure to situational uncertainty increases the new venture's repertoire of organizing processes. Specifically, it increases the diversity and dexterity of the start-up's repertoire of organizing processes.

Proposition 2: The intensity of uncertainty increases the new venture's repertoire of organizing processes. Specifically, high intensity of uncertainty increases the diversity and dexterity of the start-up's repertoire of organizing processes.

Influence of Situational Uncertainty on the Firm's Cognitive Maps

As start-ups entered foreign markets, they often found their beliefs challenged, prompting them to seek and test alternative approaches to organizing. At the process level, the actions taken by these start-ups were reflective of capability development via both trial-and-error learning and learning-by-doing. Trial-and-error learning refers to changes to firm behavior based on insights gained from exposure to situations that refine existing knowledge or reduce variation in activity (Argote, 1999). For example, the CEO of HELLO commented that the start-up made numerous attempts at carving out its own value propositions by bundling custom software with different providers in the North American market, but failed. After a few iterations, HELLO's managers realized that custom packages were inappropriate for this product and modified its platform and the value proposition, which it leveraged for subsequent entries into European countries. Apart from learning about the product positioning for foreign entry, the causal relationships between organizing processes and their outcomes became *transparent*. HELLO had initially opened offices in countries where founders were present but then realized that the costs of coordination and service delivery were too high in North America, leading it to adopt a reseller model for this market. Particularly revealing about this example was that both the repeated exposure to situational uncertainty and the intensity of that uncertainty contributed to a greater transparency of causal relationships between process and outcome.

Learning-by-doing refers to improvements in existing processes because of repetitive execution of the same task (Arrow, 1962). An illustrative example is SNOW's use of alliances to cross-sell its mobile weather forecasting services. It entered into an alliance for the Finnish market and then used similar arrangements in other Scandinavian markets. For each subsequent international alliance, it refined the content of agreements by learning from the experience of its previous relationship in another market. Refinements were made in the contracting process, content, and pricing of services. In turn, each alliance had a marginal improvement over the previous one and became increasingly focused on the service offered. In SNOW's case, it is noteworthy that situational uncertainty was not high because entry was into other Scandinavian markets. Because these markets had institutional similarities, SNOW did not generate new organizing processes but rather modified the sequence of deploying them and adjusted its cognitive map as to which sequence would be appropriate at any given time.

In both trial-and-error and learning-by-doing processes, start-ups incorporate their improvements as refinements to existing organizing processes or by generating new

processes (Argote, 1999; Levitt & March, 1988). Chandler's (1992) work on organizational change also refers to "learned routines"; he surmises that change processes are based primarily on organizational responses to events by experimenting with new actions which, if successful, become routinized. In our data, firms learned from their successes *and* changed substantively based on their failures. For example, HELLO overestimated the maturity of the market to accept their technology and made substantial investments that had to be written off. The management was then more careful in subsequent entries with regard to their processes on market analysis and adjusted their entry processes accordingly. The VP of operations commented:

> Operators were very interested [in our product]. It was discussed very much, but in the end their ability to buy mobile marketing systems, they did not have the business know-how. Ultimately, we did not understand mobile marketing from an operator perspective, though an operator owns the medium [channel]. . . . We made mistakes there, we overestimated the maturity of the market, in America, in particular. . . . We had to exit and—instead of moving with an aggressive sales strategy—we almost made a U-turn.

In our interviews, we gleaned that start-ups tended to enter a foreign market with a presumptive causality between an organizing process and a desired outcome. Especially if the firm had multiple international entry experiences, it derived its causal logic from prior success and failure outcomes. Repeated and intense situational uncertainty triggered not only trial-and-error processes in search of the right organizing solution, but, in many cases, prompted the start-ups to conduct a critical review of their own beliefs about causal relationships between organizing processes and their outcomes. Starting from established beliefs concerning "what works" (Barr et al., 1992), exposure to foreign market conditions prompted firms to investigate contingency influences in different country markets ("what works when") and develop hypotheses concerning underlying causal mechanisms ("why what works when").

Internationalization had two distinct effects on the start-ups' cognitive maps. First, the repeated exposure to intense uncertainty challenged hitherto hidden assumptions of the start-ups' organizing processes. Similar to other studies on cognition in high velocity environments (Bogner & Barr, 2000), we found that such challenges increased the transparency of cognitive maps regarding the cause–effect relationships between the deployment of specific organizing processes and their outcomes. Second, the development of higher-order cognition enabled start-ups to recognize complex relationships and the appropriateness of specific organizing processes in different environments; that is, it improved the percipience of their cognitive maps. The organizing activities and related cognitive maps appeared to complement one another so as to enhance the start-ups' ability to meet their goals in foreign market environments. For example, the CEO of EXCEL was quite clear in describing the causal rationale and the importance of a shared cognition of what works in specific markets but may not work in other segments. In our conversations, he vigorously emphasized the need to integrate experiences and establish causal logics for why certain outcomes were achieved from specific processes. He encouraged his team members to challenge his arguments and question the logic behind his attributions:

> [To promote] learning or best practice, the idea is to listen to each other. I listen to somebody else's story of what worked and why. [. . .] In Finland, people still argue [about what is the right way] but outside Finland no one argues with the boss. The idea is to try finding good ways of working and then try getting other people buy the idea

as well. Results are dependent on the [individual's] will to achieve the results and whether the method of achieving results was right. A good idea is extremely easy to implement poorly . . .

Heterogeneous experiences provided by intense uncertainty of foreign market entry and repeated exposure to uncertainty from multiple entries helped firms understand cause–effect relationships between actions and outcomes. In virtually all cases, the start-ups faced exigencies that challenged their causal assumptions about the "best way" of doing business in the foreign market. These resulting experiences enhanced the transparency of cause–effect relationships between organizing processes and outcomes, and helped build percipience with regard to which process was likely to yield the desired goals. Therefore, we posit that:

Proposition 3: Repeated exposure to situational uncertainty positively affects the formation of new ventures' cognitive maps governing the deployment of its organizing processes. Specifically, it increases the transparency and percipience of a start-up's cognitive maps.

Proposition 4: The intensity of uncertainty positively affects the formation of new ventures' cognitive maps governing the deployment of organizing processes. Specifically, it increases the transparency and percipience of a start-up's cognitive maps.

In summary, situational uncertainty presents firms with opportunities to learn. We found that repeated and intense situational uncertainty triggered idiosyncratic responses and generated new organizing processes, some of which achieved desired goals while others failed. These heterogeneous experiences provided the start-up with a robust cognition of processes that were more likely to work in a given scenario. The combination of organizing processes and a cognitive map guiding their deployment improved the capacity of the firm to adapt not only to the focal uncertainty in the foreign market, but also transformed the way it organized its core business in the domestic market and in other foreign markets in which it had some presence.

Moderating Effect of Resource Fungibility

A firm's resource endowment plays a critical function in the formation of capabilities because resource commitments enable the execution of an organization's capabilities (Amit & Schoemaker, 1993). The presence of excess resources or slack might increase experimentation and risk taking (George, 2005b; Mishina, Pollock, & Porac, 2004). If true, slack may lead to the generation of new processes and capabilities. Rather than slack, we found that it was resource fungibility that had the most important moderating influence on capability formation. Because start-ups often face significant resource constraints, it makes sense that flexibility in the deployment of resources had an especially potent relationship with capability development.

Resources are stocks of assets that are owned or controlled by the firm (Amit & Schoemaker, 1993). In internationalization process theory, resources are seen as moderators of firm exposure to foreign markets or enablers of rapid internationalization, yet the attributes of resources have seldom been given explicit consideration (Anand & Delios, 2002). We found that resource fungibility confers an additional dimension of resource mobility; that is, fungible resources could be transferred to foreign markets and adjusted to fit local conditions (Anand & Delios). We observed distinct mechanisms by which resource fungibility moderated the relationship between start-ups' exposure to situational

uncertainty and their development of organizing processes and cognitive maps, which are experimentation, experience transfer, and learning through adaptation.

We observed multiple instances where resource fungibility enhanced the propensity to engage in experimentation because it reduced the cost of deploying the same resource for alternative purposes. Often, the fungible resources consisted of generalist human resources, that is, people who could "react on their feet" as they were exposed to uncertainty. The fungibility of human resources was especially salient in start-ups with low role specialization and broader role definitions among its employees. In technology resources, fungibility was manifested in the flexibility with which the product or service could be adjusted to address new product platforms, standards, or delivery systems in foreign markets; such fungibility was at times achieved through the creation of generic and/or modular design. The CEO of CHART elaborated:

> We entered the U.S. market with the idea of selling Internet-based products. After visiting two conferences, however, we discovered that the favored product concept in the U.S. relied on a PDA platform. This experience prompted us to check our assumptions and redesign the product to an alternative platform. We literally put our product development plan to the shredder and started over again. We reassigned the product within an impressive 3 days, thanks to the generic way the software had been designed. We also readjusted our business plan on the fly to support the new platform, adjusting its product marketing and delivery processes accordingly.

Here, CHART could transform its strategy because its product platform was flexible. This strategic shift involved changing the way it defined and addressed its target market and its choice of distribution channels and support functions, which necessitated further modifications and extensions to its repertoire of organizing processes. In contrast, low resource fungibility inhibits experimentation by increasing the cost of developing or implementing new organizing processes and related cognitive maps. For example, CASH had started out as a spin-off from a large firm's finance department to sell corporate financial software services as an application service provider. But the company had difficulty penetrating European markets, the CEO lamented:

> We had our own sales people . . . in Stockholm, London, and Luxemburg. We offered the solution to close to 500 companies in Europe . . . [in spite of good feedback] somehow the projects always froze and the sales cases did not proceed . . . in the end 15 of them became our customers so the hit rate was quite bad.

Later, CASH realized that the product concept simply would not work in the intended market as the product was highly specific and the sales force had experience in selling to large firms; modifying its processes was onerous because of low fungibility of its resource endowments.

We also found that resources embodied heterogeneous experiences and that redeploying fungible resources (especially human) could, in effect, transfer cumulative heterogeneous experiences from one market to the other. To continue the CASH example, the firm went on to hire a manager responsible for its international markets. This individual devised a novel and efficient approach to sales, largely because he could learn from experiences in the Netherlands, the United Kingdom, Luxembourg, and Portugal. This manager, who spoke five languages, commuted between these countries to supervise sales operations. On discovering that the United Kingdom was a difficult market in which to initiate corporate contacts, he improvised a new marketing and sales technique to deal with this challenge, which was subsequently successfully deployed in other markets.

Resource fungibility enabled the start-ups to better understand cause–effect relationships in different contexts, as resources were shifted from one to another. Experience transfer gave rise both to a stronger transparency and percipience of the start-ups' cognitive maps. Some degree of resource adaptation to local conditions was usually necessary, triggering processes of sensemaking as firms needed to understand what changes in organizing processes were required to respond to situational uncertainty. Furthermore, in being able to deploy the same resources in alternative situations, the start-up learned not only about new contexts through a well-understood lens (i.e., the fungible resource), it also learned more about the resource itself by examining its effects in a new context. In summary, resource fungibility enabled start-ups to experiment with alternative organizing activities, contributing to a greater diversity, dexterity, and depth of their organizing processes. Particularly through resource transfer and adaptation mechanisms under conditions of high situational uncertainty, resource fungibility facilitated sense-making processes which improved the transparency and percipience of the start-ups' cognitive maps by improving its understanding of its own capabilities and of the new context. Therefore, we propose:

Proposition 5: Resource fungibility positively moderates the relationship between situational uncertainty and a new venture's repertoire of organizing activities. Specifically, fungibility increases the positive impact of repeated and intense situational uncertainty on the diversity and dexterity of its repertoire of organizing activities.

Proposition 6: Resource fungibility positively moderates the relationship between situational uncertainty and a new venture's cognitive maps governing the deployment of its organizing activities. Specifically, fungibility increases the positive impact of repeated and intense situational uncertainty on the transparency and percipience of the start-up's cognitive maps.

Moderating Effect of Prior Shared Experiences

Research on capability formation in start-ups emphasizes the role of previous work experiences of founders (Helfat & Lieberman, 2002; Helfat & Peteraf, 2003; Mosakowski, 1998). Prior experience of the team influences the dynamics of decision making, including entry into new markets, by invoking the belief that certain solutions should work for a given market (e.g., Helfat & Lieberman). These prehistory experiences provide schemas for action and legitimize these actions through storytelling and narratives (Lounsbury & Glynn, 2001).

We detected variability in the organizing processes developed by the start-ups when the feedback from existing actions deviated from expected outcomes. First, if entrepreneurs had accumulated significant prehistory experience in an industry sector, they tended to apply "tried and true" processes that had worked before. Conversely, if the team had little experience in the sector, it was more open to alternative solutions. For these teams, an uncertainty-induced problem would readily trigger a trial-and-error learning process, in an effort to understand how *ex ante* expectations and processes should be modified so as to obtain the desired objectives.

Those start-ups with substantial shared prior experience appeared reluctant to revise interpretations based on foreign market feedback, which retarded efforts to devise alternative solutions. It appeared that their repeated exposure to familiar action–outcome relationships strengthened their beliefs in existing assumptions on causality. Therefore, the more prior experience top managers shared, the less they altered processes, even if

situational uncertainty was high. For example, when EXCEL attempted its first international expansion in the late 1990s by acquiring a Swedish software project company, the team had difficulty in managing this subsidiary because of cultural differences. In spite of recognizing that these differences exist, some managers continued to force fit their organizing processes to the Swedish subsidiary:

> Even if we went as close to Sweden, I could say now that I still don't understand how the decision making and communication culture works. [. . .] For example, if in Finland I raised my voice on the hallway and said that something has to be done like this and that, people would stand up, argue and ask if we could do it some other way. If I did the same in Sweden, people would go to their rooms and you wouldn't see them until the following day. Then you would notice in the kitchen and in other places that they would discuss in depth what had happened and it seemed that things would revert to the same old informal routines . . .

The managing director went on to describe how he had tried to change the way the subsidiary did business because ". . . we know from our experience how this should be done." Still market entry failed because *they* ". . . just would not get it." Eventually, EXCEL had to abandon its acquisition because it felt that it could not transfer its processes and cognitive maps to other markets.

Conversely, we noticed that if the team had little previous experience in its target sector, it was ready to experiment with different entry modes. A problem would trigger an informed trial-and-error learning process, during which teams scanned and sometimes even tested alternative organizing processes to find an optimal solution. Sometimes firms simultaneously executed multiple alternative processes and strengthened their repertoire of organizing activities and related cognitive maps. For example, STAR adopted a three-pronged strategy of partnerships, direct sales through traditional and innovative industry channels, and bundling its product offering with strategic partners' products that enjoyed established clientele within the sector. Therefore, if the start-up's management team had fewer shared prehistory experiences, it could search and test the market more extensively as its responses were not conditioned by previous, and possibly incompatible, experiences. By relying on shared experiences, firms emphasize a notion of their success experiences (i.e., "what worked") over generating new schemas and solutions, falling into a competence trap (Levinthal & March, 1993). Therefore, we posit that:

> **Proposition 7:** The degree of shared experiences of the entrepreneurial team negatively moderates the positive impact of repeated and intense situational uncertainty on the development of organizing activities. Specifically, the greater the prior shared experience, the lower will be the increase in the diversity and dexterity of organizing activities resulting from repeated and intense uncertainty.

> **Proposition 8:** The degree of shared experiences of the entrepreneurial team negatively moderates the positive impact of repeated and intense situational uncertainty on the development of cognitive maps. Specifically, the greater the prior shared experience, the lower will be the increase in the transparency and percipience of cognitive maps resulting from repeated and intense uncertainty.

A Research Agenda on Capability Development in New Firms

Our qualitative study was designed to provide initial evidence and trigger areas for future research. We contribute in two areas in particular: first, to the emergent literature on

organizational capability development in entrepreneurial firms (Zahra et al., 2006); and second, to the already well-established literature on international entrepreneurship. We contribute to the first by highlighting salient microprocesses that govern the creation of new organizational capabilities in entrepreneurial firms. We contribute to the second by opening up the black box of internationalization learning and by demonstrating the processes through which internationalization may give rise to organizational advantage. Speaking to the capabilities literature, this study provides insights that may not have been possible in a deductive study, thereby making two key contributions: (1) the importance of situational uncertainty as a trigger for developing a language of organizing and (2) the role of learning from heterogeneous experiences on capability development. In this section, we build on our findings to propose a theoretical foundation for work in learning and capabilities in new ventures.

The Language of Organizing: Implications for Capabilities and Entrepreneurship

The emergent literature on organizational capabilities in entrepreneurial firms suggests that entrepreneurial firms are not simply new and small versions of incumbents (Bingham et al., 2007; Sine et al., 2006; Zahra et al., 2006). From the perspective of entrepreneurship, some of the constraints of theories developed in large firm contexts are obvious. First, new firms are seldom started with an organizational heritage of well-formed capabilities, which emphasizes the creation of *de novo* capabilities over the modification of existing ones. Second, the sources of inertia are likely to be different in new and small organizations, where there usually is no layer of middle managers to separate top management from operations. Our study has contributed to the literature on entrepreneurial capabilities by showing how, in entrepreneurial firms, the development of routines, as well as repetitive application, matters to the development of change capabilities. Thus, in contrast to incumbents, the likelihood of an entrepreneurial firm of implementing successful change tends to initially increase as a function of management team experience and organizational age. Our findings also highlight the importance of the interaction of routine-based and cognitive logics for the development of organizational capabilities (Bingham et al.). This interaction may be particularly salient for entrepreneurial firms, given the absence of well-formed and deeply embedded organizational routines as well as the absence of a middle management layer. In entrepreneurial firms, thus, the link between managerial cognition and capability deployment is likely to be particularly direct, highlighting the salience of top management team's cognitive processes for the entrepreneurial firm's ability to proactively adjust.

In our sample, we found evidence of a strong association between situational uncertainty and the rate and speed with which start-ups developed their repertoire of organizing processes and the attendant cognitive maps. There are two issues embedded in the relationship between organizing processes and cognitive maps that merit further discussion: (1) the organization became aware of its repertoire, or vocabulary, of skill-based routines and nonroutine processes and (2) an inclination to deploy certain combinations of actions under certain triggers of situational uncertainty; that is, a grammar or shared understanding of which actions or sequence of actions are deployed when a specific condition is observed. Capabilities arose from the interplay of a firm's cognitive maps and its repertoire of organizational processes, where the *language of organizing* is the awareness of the vocabulary of organizational processes and the comprehension of their situation-specific combinations that allow the start-up to adapt to its environment.

The *vocabulary of organizing* focuses on processes, rather than on an exclusive reliance on routines, as constituent elements of capabilities. Most studies on capabilities emphasize the skill-based aspect of capabilities; routines are executed deftly, which improves performance outcomes (Winter, 2003). An alternative research stream emphasizes a language-based argument that is typically grounded in sociological perspectives of work in nonfirm settings such as university residence halls (Feldman & Pentland, 2003). Language-based explanations stress routinization as well, but from a shared understanding perspective. In taking this perspective, we substantially extend recent research on entrepreneurial cognition (e.g., Bingham, 2009; Grégoire Barr, et al., 2010; Grégoire, Corbett, et al., 2010; Haynie et al., 2010; McKelvie et al., 2010) to capability development and deployment. Our results suggest that language-based *and* skill-based explanations of capabilities are required to build a comprehensive theory of capabilities. Clearly, an organization is capable of doing something only when it can reliably execute processes, which emphasizes skill-based arguments. However, adaptive behaviors and changes within processes can be more fully explained using cognitive and language-based explanations of capabilities. Therefore, combining both perspectives enables researchers to provide compelling rationales to the selection of specific organizing processes as responses to the environment from a plurality of possible combinations, an issue that is fundamental to understanding the process of organizational adaptation to competitive environments.

A second and related issue is that capabilities are often represented as the culminating effect of routines and resource configurations rather than the process of search for optimal solutions. While some studies explicitly articulate that capabilities can evolve over time (Helfat & Peteraf, 2003), this dynamism needs to account for changes in underlying processes along with shifts in resource endowments. Our analysis reveals a *grammar of organizing*: capabilities are moving targets and firms engage in a continuous search for fit between the external context and internal resource conditions rather than existing in a relatively "steady state" or "best" configuration.

In our sample, resource fungibility, in particular human capital endowments, played a key role in the speed with which new processes are generated or modified. In several firms, entry into multiple foreign markets was made possible by the ease with which employees could be moved between markets or if employees possessed skills to operate in very different markets. This observation is consistent with Rindova and Kotha (2001), who found that in hypercompetitive environments, firms continuously "morph" their organization structure and resources to support the changing demands placed on their systems as markets evolved. In that regard, capabilities are neither the normative "best practice" nor are they culminating "end-states" that reflect appropriate routine and resource configurations. Instead, we find that, for new and established ventures alike, capabilities are continually evolving combinations of organizing processes and cognitive maps that allow organizations to reliably execute optimal solutions in uncertain markets.

Several potential extensions follow directly from our notion of language for organizing. For example, what individual, firm, or industrial-level factors foster or hinder its development? Similarly, are there settings in which particular importance has to be attributed to the language of organizing? Most likely, this may be the case for contexts in which the importance of cognitive understanding significantly outweighs the potential of behavioral learning. Thus, the existence of a language for organizing may play a more significant role when process outcomes are hard to replicate, are tacit, or are intangible, a description that seems apt for many high-technology or project-based industries as well as services. Moreover, regarding the effect of experience on the development of capabilities, while our findings show that shared experience exhibits a negative effect, future research

may inquire into the role of diverse past experience. Is more diversity in past experience always good? Or, is there a certain degree of common ground that is necessary for past experience to be conducive to the development of a language for organizing? Finally, do other contextual factors exist that may moderate the effect of past experience on the formation of organizational capabilities?

Learning to Be Capable: Heterogeneous Experiences, Migration, and Mutability

A central contribution for the learning literature lies in articulating the causal mechanisms by which new firms learn to build capabilities. Organizational learning literature emphasizes the importance of the cumulative effect of experiences on firm behaviors (Beckman & Haunschild, 2002; Bingham et al., 2007; Fiol, 1994). Similarly, recent studies also highlight the importance of learning from failure for performance and survival (Corbett et al., 2007; Haunschild & Sullivan, 2002; Miner et al., 1999). By emphasizing a cumulative learning effect, researchers have extended learning arguments to capability development (George, 2005a). However, the impact of heterogeneous experiences, in the form of organizational success and failure, has received little attention. In this study, we explain how heterogeneous learning experiences influence the formation of capabilities. Particularly, our data indicate that uncertainty-induced problems create multiple opportunities for the new venture to learn and (1) expand the diversity of its organizing processes and (2) improve the dexterity with which these are executed. Also, situational uncertainty challenges the causal assumptions between executing a process and its desired outcomes. By succeeding or failing, the causal assumptions are challenged or strengthened and improve (1) the transparency with which processes are linked to outcomes and (2) the percipience of firms to recognize which processes are likely to work and under what conditions.

Heterogeneous experiences thus allow firms to develop superior mental maps explaining the efficacy and recombinability of organizational processes. This has two distinct, yet related effects on their ability to develop and deploy new organizational capabilities constituted by such processes. First, an improved understanding of "why what works when" will increase the organization's ability to re-use existing processes and apply them in varying contexts. In our sample, several start-ups leveraged their experiences to improve their business model or their domestic operations in addition to their foreign markets. This observation indicates that there may be *migratory* applications in capabilities developed out of heterogeneous experiences, which should also be fundamental to explaining how firms can adapt dynamically to ever-changing environments, extending the applicability of our findings to the context of dynamic capabilities (Eisenhardt & Martin, 2000; Teece et al., 1997). Second, increased transparency and percipience will foster *mutability* of organizational processes and capabilities. Our data suggest that variety of experience renders organizing processes and cognitive maps more easily mutable; that is, experiences allowed start-ups to develop a broad understanding of how their business model worked and how the underlying capabilities could be changed and reorganized under different environmental conditions to accomplish organizational objectives. The causal understanding of how different processes work or do not work together in varying environments allows for continuous adaptation in the deployment of capabilities by composing them using different and appropriate combinations of organizing processes that are part of the firm's language of organizing. As a consequence, we argue that learning from heterogeneous experiences is an essential part in explaining how firms, by developing robust mental maps about the cause–effect relationships of organizational

processes, become dynamically adaptable. Thus, their dynamic capabilities will be a result of their understanding of the causal mechanisms underlying organizational processes, and how these can be (re)combined in different contexts to be deployed as new capabilities.

In addition, these results highlight several interesting and fruitful areas of research. For example, do heterogeneous learning experiences lead to more robust capabilities that have broader applications? Why and how does success and failure experience improve adaptability and, do the two operate to the same degree and in the same causal pathways? What factors influence the mutability of organizing processes? Why are some capabilities more migratory in application than others? How does redundancy in organizational processes influence capability development and mutability? By asking these related questions, researchers could investigate learning at multiple levels of analysis. For example, if processes are generated by individuals or by teams, how does individual success or failure experience influence team or organizational capabilities? How do firms build a process by combining pieces from multiple experiences or prior routines? While this study sheds some light on these issues, it encourages systematic analysis of the influence of learning on the micro- and macroprocesses of capability formation.

Internationalization Learning and Learning to Internationalize

For the international entrepreneurship literature, our findings imply two salient implications. First, our study suggests that internationalization is a distinctively different form of organizational diversification, as it combines convergence with divergence. Convergence is created in the form of what the firm seeks to "do" (Winter, 2003) in the foreign market, as most foreign market entries seek to extend the firm's current business model for application in cross-border markets. This introduces a subtle adaptation need, as the firm's technological focus or its market segment (apart from the geographical market) does not necessarily change in any obvious way. Instead, internationalization adds an additional layer of external uncertainty to the market and technological uncertainty to which the new firm is already subjected (Autio, Bruneel, & Clarysse, 2010). This way, new venture internationalization offers a particularly opportune context for studying how organizations develop new capabilities. Our study shows that the study of such processes in the international new venture context has the potential to contribute toward the broader organizational literature.

Second, our study has contributed toward the literature on international entrepreneurship by opening up the black box of internationalization learning, as well as illuminating some of the microprocesses underlying "learning advantages of newness" (Sapienza et al., 2006). Our findings suggest that such effects arise from an intricate interplay between managerial cognition and incipient processes in entrepreneurial organizations and they may constitute a potentially important formative source of competitive advantage in entrepreneurial firms. Together with the growing body of research on new venture internationalization, our study shows how new venture internationalization constitutes a distinctively different form of internationalization, the study of which will benefit from the development of dedicated theoretical frameworks (Bingham, 2009). Future entrepreneurship research should continue to exploit the opportunities offered by this exciting context.

Deriving New Questions: Triggers, Individuals, and Internationalization Capabilities

Our results suggest areas of research relating to how new capabilities emerge and solidify in new ventures. By using the developed concepts, we encourage future studies to

take a closer look at the constituting elements of capabilities (the vocabulary of organizing), the conditions that lead to their emergence and formation (grammar), and aspects that foster cognitive learning (heterogeneous experiences). Derived from these concepts, and in addition to the questions we have raised earlier, in the following, we highlight three avenues which we think are of particular importance to the field of entrepreneurship, namely triggers of capability emergence, the role of individual imprints, and capabilities in new venture internationalization.

What causes a start-up to develop and deploy new capabilities? Our results point toward an external stimulus, situational uncertainty, and how subsequent cognitive learning leads to the formation of capabilities. This raises the question of whether and how internal stimuli, such as strategic planning, initiate emergence and development of new capabilities. Because of its direct connection to the literature on opportunity recognition, discovery, and creation (e.g., Bingham et al., 2007; Grégoire, Corbett, et al., 2010; Haynie et al., 2010; Mitchell et al., 2007), this question is of central importance to the field of entrepreneurship. We are confident that a perspective that is conscious of cognition processes will prove to be particularly informative on this subject. Moreover, we think that this perspective will also be value-adding to recent discussions on dynamic capabilities in entrepreneurship. In particular, Zahra et al. (2006) propose in a conceptual paper that situational uncertainty facilitates the development and use of dynamic capabilities, also suggesting that it is external rather than internal triggers that foster the emergence of dynamic capabilities in new ventures. Our notion of organizational grammar may aid researchers to better address the question of how new ventures learn to dynamically reconfigure their resources and processes. In addition, empirical research on this issue and its boundary conditions are still absent from the entrepreneurship literature.

When we examine the role of individuals in capability formation, our study gives clear indication that both founders as well as individual employees might affect this process. First, our findings show that an important outcome of convergence in an organization's cognitive maps and the sophistication in the language of organizing is the top management team's ability to express identity and communicate strategy to its customers and other stakeholders. In our sample, managers emphasized that entering specific markets revealed their own strengths and limitations that, in turn, helped to effectively develop and execute their strategy. As a consequence, we find that managerial skill and expertise show a direct relation to the development of a language for organizing. Second, our findings on the negative impact of shared experience strongly support the notion of founder imprints (e.g., Burton & Beckman, 2007). Future research should look at whether and how founder imprints may impact the language of organizing and, thus, new capability development and deployment, even after considerable time has passed since the inception of the venture or even after they have left the firm. Finally, we see that individual employees themselves, in particular when they represent important "fungible human capital," may have a substantial impact on capability formation. Whether or not such individuals are capable of leaving residual imprints on the processes they help initiate is still an open question. Generally, our findings echo recent calls for research on the microfoundations of capabilities.

Finally, recent work has evoked renewed interest in learning and capability development during internationalization (Bingham, 2009; Bingham et al., 2007; Sapienza et al., 2006). Our study suggests that internationalization, in the context of new ventures, may give rise to learning and capability development. A start-up is subjected to a series of tests during which its business model and related organizing processes are repeatedly challenged, a process that could be likened to a serial "trial-by-fire" (Swaminathan, 1996). Here, learning is different from what has been described in the internationalization

literature, where it is seen as a behavioral regulator of incremental escalation of commitment (Andersen, 1993) and learning during internationalization is confined to institutional conditions or the process of internationalization (Delios & Henisz, 2003). As a consequence, we call for future research to look at cognitive processes that lead to the development and deployment of capabilities conducive to internationalization. We are confident that our concept of language for organizing can be helpful in extending the little research which is implicitly (e.g., Nadkarni & Perez, 2007) or explicitly (e.g., Bingham) taking a cognitive perspective on new venture internationalization.

Moreover, in our data, internationalizing start-ups confronted the tension between convergence of objectives to be achieved and divergence of institutional contexts in which to achieve them through a process of capability development, with far-reaching implications for the start-up's ability to manage not only the market entry but also its domestic business. This observation supports some theorists' contentions that new venture internationalization may be different from both late, reactive modes of internationalization (Johanson & Vahlne, 1977) as well as from multinational firm internationalization (McDougall et al., 1994). Their heterogeneous experiences during internationalization may render international start-ups more innovative and proactive than their domestic-focused counterparts. That is, such firms may be more innovative because they have internationalized, rather than becoming internationalized because they possessed innovative capabilities. This dynamic of opportunity-driven capability formation merits continued research and attention by international management scholars.

Limitations and Conclusion

For any qualitative study, the limitation of narrow sampling and scope is apparent, and this longitudinal field study is no exception. Regardless of all due care in design, selection, data collection, and analysis, we cannot dismiss the possibility that some observations may have been different had we chosen a different industry or home country. For example, the propensity to venture across borders or to experiment with business models and processes may be different in less technology-intensive industries or in countries with more (or fewer) bordering countries or with larger (or smaller) home markets. Nevertheless, these selections were not idiosyncratic or uncommon, and the increased insight made available by limiting variance in these important contextual variables made it worthwhile. Furthermore, we were not interested so much in the propensity to internationalize as in how firms internationalizing develop the capabilities to do so.

Indeed, the primary thrust in this article was to identify causal factors that influence the development of capabilities in start-ups. To that end, we were quite successful. Our data from the interviews and follow-on visits revealed adequate variability that helped capture the essence of capabilities in start-ups, that is, the language of organizing. Identifying the relationship between situational uncertainty and the generation of organizational processes and its attendant cognitive maps are our study's key contributions to the literature. As firms learn, they develop new vocabulary and increase their comprehension of their internal processes that allow them to reconfigure their business models. We found that repeated and intense situational uncertainty, as caused by internationalization, quickened this learning process in start-ups and expedited the adaptation to market environments. Organizational factors, resource fungibility, and shared experiences were important determinants of the variability in capability development across start-ups. We encourage further examination of the emergence and evolution of capabilities in start-ups.

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