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# How do entrepreneurs know what to do? learning and organizing in new ventures

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**Abstract** Acquiring the knowledge they need to organize new businesses is a life-long learning process for nascent entrepreneurs, both before and during the organizing process. We argue that creating viable and profitable ventures depends not only on the habits, heuristics, and routines that nascent entrepreneurs have acquired from family, schools, and work careers prior to the startup stage, but also on what they can learn by doing, borrowing, and experimenting during the startup process. Entrepreneurs without effective habits or heuristics, or who have acquired less knowledge or fewer routines, may not be able to learn fast enough from feedback during the startup process to avoid being selected out. We conclude the paper by offering critical questions and a research agenda for learning and organizing in new ventures.

**Keywords** Evolution · Entrepreneurship · Learning · Routines · Heuristics · Habits

**JEL Classification** B52 · Institutional · Evolutionary

## 1 Introduction

In nearly all modern capitalist economies, people see business ownership as a desirable and feasible status. Positive conceptions of “entrepreneurs” and “entrepreneurship” have been pervasively diffused because multiple institutions—the media, education systems, governments, and public opinion—have bolstered the cultural

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appeal and social legitimacy of creating new businesses. Cross-national studies have found that millions of people participate in new venture creation every year, although there is large variation in startup rates among countries (Blanchflower et al. 2001; Kelley et al. 2011). Concomitantly, the large numbers of startup attempts are matched by equally large numbers of failed efforts (Sadeghi 2008; Levie et al. 2011). Despite the positive valuation people place upon creating a successful venture, the majority of attempts are abandoned after a few years and only a minority survives and succeeds in becoming profitable entities. As Loasby (2007:1104) noted, "Though entrepreneurship is purposeful, it is an evolutionary process of trial and error; and error is more likely than success."

We believe that understanding variation in levels of entrepreneurial learning and entrepreneurial knowledge is critical to explaining the survival and growth of new ventures. Entrepreneurs must develop "know-how," "know what," and "know who" knowledge in a context substantially different than that facing managers in established firms (Argote and Miron-Spektor 2011). To the extent that such knowledge is institutionalized in organizational routines and other structures, it becomes available to be drawn upon via procedural, declarative, and transactive memory (Cohen 2012; Miller et al. 2012). But first, entrepreneurs must be exposed to the knowledge and find ways to learn it, or develop it on their own. Organizational learning theorists have emphasized three primary ways by which people learn: learning by doing through direct experience (Arrow 1962; Levinthal 1996), learning through imitation, copying, and borrowing (Haunschild 1993; Beckman and Haunschild 2002), and learning through experimentation, either intentional or accidental (Sitkin 1992).

What makes the situation of entrepreneurs starting new ventures different from that of managers in established firms with regard to learning and knowledge? Unlike managers in established organizations who generally follow or modify pre-existing routines already selected by others, entrepreneurs begin with mostly a blank slate. They must initiate rules or principles and experiment with them until they find the most effective or appropriate ones for their new businesses. Entrepreneurs who begin with inadequate knowledge or experience will feel strong pressures toward learning by doing. Entrepreneurs who have acquired routines or organizing procedures from existing workplaces may find it easier to muddle through the initial stages but nonetheless they must learn to anticipate and cope with environmental changes.

Entrepreneurial learning must therefore be understood in dynamic terms, through a life cycle (Van de Ven and Engleman 2004) and life course perspective (Elder et al. 2006). From the viewpoint of the individuals involved, the issue is one of entrepreneurial learning, and from the viewpoint of the organizations they attempt to create, the issue is one of organizational learning. Recent developments in the study of organizational routines and organizational learning have gone a long way toward adding a dynamic dimension to our theories (Becker and Lazaric 2009; Rerup and Feldman 2011). However, as Bapuji et al. (2012:1588) noted, previous research has mostly "studied routines already in place in organizations ... but it has rarely examined the emergence of routines." In this paper, we focus explicitly on the context surrounding the emergence of new organizations and the way in which entrepreneurs draw upon their previous experience as well as the conditions they encounter during the startup process.

We argue that acquiring the knowledge they need to organize new businesses is a life-long learning process for nascent entrepreneurs. Beginning with their socialization as children and adolescents, continuing through their early work experiences, and culminating in startup attempts, entrepreneurs develop habits and heuristics and gain knowledge that can help them build viable entities. At the pre-startup stages, individuals develop habits and heuristics in their everyday lives. By interacting with parents, friends, teachers, and colleagues, individuals develop specific worldviews and working styles. The habits and heuristics built during the early life stages are probably not learned in anticipation of specific entrepreneurial tasks, but some may become relevant and useful when entrepreneurs initiate their ventures. During the startup process, once entrepreneurs have more knowledge about the specific firms that they want to create, they can identify, compare, and select effective procedures to develop new routines.

We use evolutionary thinking in our analysis. Evolutionary analyses posit that outcomes result from interactions between organizations and environments, rather than being attributable to either organizations or environments, taken separately. Every explanation is thus contingent. The effect of organizational properties depends upon environmental contexts and the effects of contexts are unknown until organizational properties are specified. Entrepreneurs use their local knowledge but because they are embedded in regional and national contexts, a comprehensive explanation requires comparative and cross-national analysis (Murmah 2003). Understanding how a “fit” arises between organizations and their contexts is therefore the key to comprehending trends in organizational emergence, transformation, and termination. We usually evaluate “fit” in terms of outcomes such as survival, profitability, and growth. A fit need not be perfect, but rather just the best fit, under the circumstances.

## 2 Conceptual framework: routines, habits, heuristics

We conceptualize the *founding process* as comprising nascent entrepreneurs engaging in *actions* that produce *outcomes* (Scott 2008; Hedstrom and Udehn 2009). Analytically, we think of the actions required to build organizations as consisting of nested sets of increasingly specific logics of action, oriented to the solution of specific organizing problems. We have identified a loose hierarchy of three levels: routines, habits, and heuristics, all of which, to some extent, can be learned. Habits and heuristics are embedded in someone’s personality but crucially also in their life circumstances. They may be cued or invoked by contextual factors, but no one enforces their performance. By contrast, routines are inherently social and interactive, being enforced by others in a social entity such as an organization. As Ostrom (1980) noted with regard to “rules,” organizational routines require some actions, prohibit some, and may leave room to simply allow others. We incorporate the concepts of habits and heuristics because we believe they affect when and how entrepreneurs learn and apply routines throughout their life course.

## 2.1 Habits

Much of human behavior is driven by habits and reactions to context-specific cues, rather than by contemplative forethought (Wood et al. 2002). The same is true of people's internal psychological processes, many of which are governed by external stimuli and events in people's immediate environment, often without their knowledge or conscious awareness (Bargh and Williams 2006). Campbell (1969) made habitual behavior a cornerstone of his evolutionary theorizing, and Hodgson has carried on that tradition in evolutionary economics. Indeed, Hodgson (2009:29–30) considered habitual behavior essential to understanding organizational routines: “routines are not reducible to habits alone; they are organizational meta-habits, existing on a substrate of habituated individuals in a social structure. Routines are one ontological layer above habits themselves.” Habits are simply dispositions to act in particular ways under certain conditions.

Habits play an important part in our analysis of how nascent entrepreneurs go about constructing new organizations. Effective human performance in complex situations usually rests on a substrate of habitual behavior. Habits, in turn, are strongly influenced by emotions, as Cohen (2007) noted in pointing out the balanced approach that pragmatists like John Dewey advocated for explaining human behavior. Schumpeter's (1934:85–91) explanation of entrepreneurial deviance and the motives underlying it also pointed to the importance of emotion in economic life (Goss 2005). Regarding their effects on entrepreneurial processes, Baron (2008) noted that affect—feelings and emotion—plays a strong role in organizing practices because entrepreneurs' approaches to coping with their tasks are heavily influenced (often unconsciously) by habits developed early in their lives. The effects of habits are even stronger in the contexts when entrepreneurs must respond to challenges quickly, such as negotiating with customers, managing relations with co-owners, and seeking more investors. When they encounter ambiguities or uncertainties in handling complex tasks, individuals are quite likely to fall back upon habitual ways of responding (Podolny 1993; Gorman 2006).

Many authors writing about corporate and entrepreneurial strategy, especially from a knowledge-based perspective, implicitly assume that entrepreneurial knowledge refers to what is in people's heads. Specifically, they assume that knowledge is available for conscious and reflexive processing. By contrast, much of what nascent entrepreneurs bring to a startup attempt involves social or automatic cognition, unconscious mental processes, and habitual behaviors of which they are oblivious. Therefore, we need to understand the origins of habits and how they are cued by external contingencies.

## 2.2 Heuristics

We examine heuristics as well as habits to emphasize that entrepreneurship theories should be grounded in a comprehensive view of human minds. Our arguments concern what nascent entrepreneurs *do* in constructing new organizations, thus putting an emphasis on action and outcomes. Even though humans are often governed by their

own habits, constrained by organizational routines, and guided by notions of appropriate social mechanisms, they will still have many opportunities to make choices. Understanding how choices are made requires that we delve into the growing literature on heuristics. For many years, a group of investigators that some called the “heuristics and biases” research program has argued that people use a variety of mental shortcuts when they are faced with uncertainty.

These mental shortcuts, also called heuristics, do not make use of all available information and sometimes lead people to use unwisely the information they do collect. Thus, for example, researchers have shown that people rely too heavily on judgments based on small samples, are overly impressed by highly visible and easily available information, and seem unable to grasp the laws of probability (Tversky and Kahneman 1981). One cognitive bias of particular interest to researchers studying nascent entrepreneurs is a tendency for entrepreneurs to be overconfident in their abilities, especially if they are the founders of their new enterprises (Forbes 2005). A survey-based study of 18 countries found a negative correlation between the level of entrepreneurial overconfidence and a firm’s survival chances (Koellinger et al. 2007), with overconfidence higher in some nations than others.

The “adaptive decision program” offers a different view of people’s cognitive abilities, thinking of heuristics as strategies and searching for the conditions under which various heuristics are used. In turn, building on the adaptive decision program, Gigerenzer and Selten (2001), Todd et al. (2012), and others have developed a more optimistic view of human minds, labeled the “fast and frugal” or the “ecological rationality” research program. The fast and frugal research program asks how well people do when using simple heuristics in real-world situations (Todd et al. 2012).

Rather than the old normative models of rationality and human fallibility, the new program identifies much of human behavior as ecologically rational. That is, it posits that people use information which is appropriate and helpful, given what’s available in their local environments. They use simple decision rules, such as “take the best,” which are good enough in situations in which time and resources must be conserved. Humans are not posited as computational machines that collect, process, and weigh all available information, but rather as doing as well as they can, under the circumstances. From this perspective, “entrepreneurial overconfidence” is actually a reflection of the situation in which entrepreneurs find themselves, rather than a simple reflection of an innate characteristic (Forbes 2005). We find this view helpful in thinking about how nascent entrepreneurs will react when they construct organizations in uncertain situations when they must make do with incomplete information and inadequate resources.

An ecological rationality approach fits well with recent amendments to the Carnegie school’s view of human cognitive capabilities, which initially took a quite pessimistic view. The Carnegie school heavily emphasized short-term expectations and actions governed by immediate feedback, arguing that long term planning is very difficult for humans. However, in the past decade or so, some in this tradition have argued that managers—and by extension, entrepreneurs—can construct crudely simplified cognitive models of the future that are helpful in anticipating the consequences of various options being considered (Gavetti and Levinthal 2000; Zollo and Winter

2002; Gavetti 2005). The ecological rationality school points out the advantages of using such simplified models.

### 2.3 Routines

Given that the concept of “routines” was introduced to the organization theory community almost three decades ago (Nelson and Winter 1982), we were surprised to find it so little used in entrepreneurship. We found few articles in entrepreneurship journals that have made noticeable use of the “routines” concept. Its diffusion to the entrepreneurship field has been delayed in part by major challenges in studying routines empirically and because the concept has mostly been used by researchers studying established organizations, rather than new ones (Phillips 2005). In contrast to previous usage, we use the concept to help us understand the challenges facing emerging organizations.

Organizational learning theorists and evolutionary economists have created an international community oriented to the development of the “routines” concept (Becker et al. 2005). In 1996, a review article summarized progress to that point (Cohen et al. 1996:683), a working group offered a definition: “a routine is an executable *capability* for repeated performance in some context that has been *learned* by an organization in response to *selection pressures*.” An article a decade later provided an updated review (Pentland and Feldman 2005), followed by an edited book in 2009 (Becker and Lazaric 2009). At around the same time, Abell et al. (2008:490) criticized the treatment of routines and capabilities in the strategy literature, noting that there was “little recognition of the need to explain the origins (or emergence) of routines and capabilities (except perhaps in terms of other routines and capabilities).” Finally, Pentland (2011) summarized the current foundations of the concept and reviewed recent research.

Pentland and Feldman (2005), following terminology used by Latour (1986), distinguished between two aspects of routines: ostensive (abstract patterns) and performative (specific actions). From an ostensive point of view, routines can be characterized as “abstract patterns that participants use to guide, account for and refer to specific performances of a routine,” whereas from a performative point of view, routines can be characterized “as actual performances by specific people, at specific times, in specific places” (Pentland and Feldman 2005:795). They noted that these two aspects of routines are interdependent, because the ostensive side not only guides performances but is also reproduced by them. Hodgson (2009) made a similar distinction as he argued that routines are “organizational dispositions and energize conditional patterns of behavior within an organized group of individuals, involving sequential responses to cues” (Hodgson 2009:33). Rerup and Feldman (2011) emphasized distinguishing between the organizational schema that represent founders’ visions or plans for their organizations versus the designed and enacted routines by which an organizations’ goals are realized. Dionysiou and Tsoukas (2013) argued that routines are reproduced when organizational members perform interactions that symbolically apply and reinforce the ostensive aspects of routines, with context-driven actions simultaneously opening opportunities for changes in them.



Levitt and March explicitly tied organizational learning to routines and the performance of firms (1988), arguing that the experiences of the past are only available in the present to the extent that they have been encoded in routines. From this perspective, learning occurs as entrepreneurs adapt in response to feedback from their actions. In their paper on entrepreneurial learning, Deakins and Freel (1998:148) argued that “routines define the firm, its knowledge, and provide the fundamental skills of the enterprise.” They argued that what entrepreneurs must do is discover routines that work and then add them to their startup’s stock of other effective routines. Trial and error learning may simply lead to the partial modification of routines, but major problems with routines may actually generate a transformation of organizational schema (Rerup and Feldman 2011). Of course, many opportunities exist for superstitious and incomplete or inadequate learning (Levitt and March 1988), and thus a startup’s stock of routines at a particular point may be insufficient to protect it against failure.

### 3 Selection and learning throughout a nascent entrepreneur’s life course

Most accounts of new venture creation begin with depictions of potential founders coming up with ideas, assembling a team, mobilizing resources, and undertaking other activities. However, selection forces and learning processes have already had an impact on people before they became involved in these entrepreneurial activities. Only a small fraction of the working population undertakes such activities each year, and they come to the startup process after having experienced highly diverse careers. Their previous experiences may have prepared them well, giving them the opportunities to acquire extensive knowledge about organizational creation, or it may have left them ill-prepared for the situations they are about to encounter.

#### 3.1 A life course model of selection and learning

Our analysis of entrepreneurial learning begins with a consideration of some of the forces affecting how people gain access to relevant experiences, especially with regard to their families of origin and schooling. Education, previous work experience, and startup experiences are important for three reasons. First, people make viable contacts through these routes, meeting others who might help them later in their careers (Audretsch et al. 2011). Second, people learn specific skills and develop habitual ways of doing things, some generic to all organizations and some specific to the industry of the startup. Learning these skills before undertaking a new venture economizes on time and effort. Entrepreneurs can thus avoid trial and error learning and the accompanying waste. Third, people can develop a framework of understanding and a contextual awareness that makes it easier for them to recognize potential problems and opportunities. Even though they may not have a readymade solution, they can at least recognize the need for action. Naïve or amateur entrepreneurs may miss these signs.

In pursuing this line of investigation, we are building on a classic concern in the literature on socialization: the development of concepts, especially by adolescents

and young adults. As Becker (1991:45) noted, “when people learn concepts, they learn a logical structure of interconnected elements referring simultaneously to a set of abstract general ideas and a body of interactional practice.” Just as children eventually come to have a basic understanding of economic principles by the time they are teenagers (Webley 2005), so too do adults eventually come to have a general understanding of what “business ownership” means. However, we believe this understanding falls far short of the practices actually required to create an organization and thus we emphasize the mechanisms through which entrepreneurs actually learn what to do.

A majority of nascent entrepreneurs enter the startup process after having completed their formal education and spending many years in a variety of jobs (Sørensen and Fassiotto 2011). As employees, managers, and business owners, they have had access to many potential learning opportunities. Some of the habits they acquired as adolescents and young adults have been strengthened, whereas others have developed as a result of working at particular occupations, organizations, and industries. They have also participated in many occupational, organizational, and industry routines, and carry that knowledge into the startup process.

Once start-up activities are underway, the process provides new opportunities for nascent entrepreneurs to apply their habits, make use of knowledge and routines from prior experiences, and develop new habits and routines. Organization and entrepreneurship theories differ with regard to the relative contribution of this “learning on the job” versus prior experience—accumulated human and social capital—and how they affect startup survival and success. Some theories of entrepreneurship downplay the importance of experience prior to a new venture’s creation, arguing that entrepreneurs cannot know, a priori, what will actually work (Jovanovic 1982; Deakins and Freel 1998). People often work part-time or for free while gaining a foothold in the labor market, and some nascent entrepreneurs are in the “planning” stage for years before undertaking activities. Similarly, entrepreneurship researchers still are arguing over what constitutes a reliable marker of when a new venture has moved from the “organizing” phase into an “operating business” phase (Kim and Aldrich 2011).

In theorizing the contexts under which entrepreneurs acquire logics of action for creating viable ventures, we differentiate three learning phases and identify the mechanisms that shape entrepreneurs’ learning in each phase. We believe that entrepreneurial learning is continuous throughout the life course and that entrepreneurs are presented with different opportunities for cultivating habits, heuristics, and routines in each life phase. We make a distinction between general habits, heuristics, and routines that must be modified to fit particular circumstances, versus task-specific habits, heuristics, and routines specifically relevant to entrepreneurship and to particular kinds of startups.

### *3.1.1 Early phase: families and socialization*

We will first consider the importance of socialization and training within families. International and comparative studies have strongly established that the children of self-employed parents are about twice as likely to become self-employed as others.

Representative longitudinal studies from many nations support this empirical generalization (Arum and Mueller 2004). Researchers have suggested a variety of possible explanatory mechanisms: transmission of values, learning of skills and routines, and development of relevant habits. Note, however, that we lack systematic evidence with regard to parental effects on the success of children's businesses (Aldrich and Kim 2007; Mungai and Velamuri 2011). We consider two possible paths of family influence: a generic set of influences with regard to psychological traits and occupational aspirations and values, and a specific set of influences relevant to entrepreneurship and entrepreneurial learning.

First, any family could, in general and regardless of parents' occupations, positively influence children's choices of occupations as well as their performance in commercial enterprises. We note two possible ways this could occur: through the inheritance of psychological traits and through the development of occupational aspirations and values. There is strong evidence for the heritability of most psychological traits, such as conscientiousness, which encompasses such sub-traits as self-discipline and control, and openness to experience, which encompasses such sub-traits as creativity and a preference for novelty (Bouchard and McGue 2003). These psychological traits can be amplified or inhibited in children through parenting. To the extent that these traits are positively associated with the skills needed to build businesses, families can be influential (Caliendo et al. 2011).

We emphasize that simply inheriting a personality disposition, such as self-discipline, does not guarantee that children will actually behave in a more disciplined way. The expression of the predisposition strongly depends upon a favorable context, and in that regard a family can enhance or suppress the predisposition. With regard to occupational aspirations and values, Kohn and others have found strong evidence that parents' value systems shape their children's orientations to the general conditions of work, including preferences for autonomy (Kohn et al. 1986). Together with habits such as timeliness and frugality, what children learn within their families could contribute to successful startup activities.

Second, we see two ways by which parents shape individuals' heuristics and habits that are specific to entrepreneurship: through specific socialization practices and through choices of educational institutions. With regard to socialization, the learning process is heavily path-dependent, which means that individuals' reactions to context-specific cues or inspirations are strongly imprinted or patterned by their early experiences. What people learn early on, and how they learn it, thus powerfully affects their heuristics and habits. Because parents are the persons with whom individuals interact most in their early childhood, parents' work habits and their particular ways of responding to challenges profoundly shape individuals' logics of actions. As for formal education, parents indirectly shape children's cultivation of habits and heuristics by helping them choose educational institutions. Aldrich and Kim (2007) noted that entrepreneurial parents may try to shape the educational experiences and peer-group choices of their children by sending them to private schools and controlling their learning environments. Later, during adolescence, they may invest in vocational or college educations for their children and eventually provide capital for business ventures.

We found much less evidence regarding whether parents can actually improve their children's performance in starting businesses. From a life course perspective, parent to child transmission of entrepreneurial routines is not a promising route (Aldrich and Kim 2007). Spells of self-employment and business ownership are quite short for most people and the chances are slim that such spells will coincide with opportunities for their children to take advantage of them. Were children to have such opportunities, they could gain valuable tacit and procedural knowledge that is much harder to obtain through other routes. However, unless children are able to work in the business as teenagers or as adults without other careers of their own, gaining direct hands-on experience from learning by doing is unlikely for most children of entrepreneurial parents.

### 3.1.2 *Later phase: access to learning opportunities*

Someone's work career can be framed in terms of the extent to which they have opportunities to learn knowledge and skills relevant to organizing a startup (Elder et al. 2006). Some things that have been learned, to the extent that they have become encoded in habits and heuristics, may have become so automatic as to interfere with their ability to respond creatively to new situations. We will consider some important spells during peoples' working careers, when they have been employees, managers, and business owners. Unlike families and schools that provide individuals with heuristics and habits that are very general, workplaces give potential entrepreneurs opportunities to cultivate routines closely connected to work situations that are specific to new venture creation. Furthermore, during early life stages, the learning process involving heuristics and habits mostly occurs when people are not anticipating being involved in new venture creation. By contrast, after individuals have worked in employer organizations for several years, entrepreneurial ideas and attempts may surface and thus the learning process in life's later phases may become more conscious and anticipatory, targeting specific routines for which individuals see value.

## 3.2 Work and learning opportunities

Unlike time spent with family or on informal instruction, working as an employee or manager can build a direct connection to specific habits and routines that might prove useful for nascent entrepreneurs (Miner et al. 2011). Indeed, from the knowledge-based perspective, scholars have made an implicit assumption that nascent entrepreneurs gain valuable procedural and tacit knowledge through their employment experiences, whether as employees or managers. Even when knowledge is gained through search rather than experience, some argue that understanding its meaning requires relevant prior experience, during which people could have gained tacit knowledge that enables them to recognize otherwise hidden contingencies (Polanyi 1966). Working with other people in organizations helps generate the "common knowledge" that enables people to move between organizations and still recognize the basic tasks that need to be carried out. We consider the possible effects of three spells of activities, some of which can be repeated: working as

employees, managers, and founders of businesses. As before, we note that some knowledge gained can be generic, applicable across a wide range of businesses, and other knowledge is specific to a particular kind of business.

Working as employees can expose people to relevant habits and routines that they might use in starting their own firms, although the process can be lengthy. Routines that require frequent practice with repeated applications can take a long time to mature. With more years of practices, skills can become habitualized and thus easily carried out without further reflection and evaluation. However, these specific routines might be somewhat narrow and only useful in a small range of applications. Moreover, as Arrow (1962:155) noted, learning that involves repeatedly solving the same problem “is subject to sharply diminishing returns.”

The concept of task-specific skills is different from that of occupation specific skills, and high skilled workers may only retain their advantages over other workers if they move into new positions making use of such task specific skills (Gathmann and Schoenberg 2007). This view suggests that nascent entrepreneurs benefit the most when they attempt to start businesses in industries where they have already obtained a substantial depth of experience. In contrast, one could argue that meta-cognitive skills that require people to recognize the appropriate contexts for specific skills will not accumulate if people simply engage in repeated applications of the same skills. Instead, the “skill” required is what Simon and Chase (1973) called “expertise,” deeply dependent upon tacit knowledge.

“Employee entrepreneurship” was developed as a concept because some researchers thought that certain employers were better than others at providing employees with the skills and knowledge they need to start their own firms (Brittain and Freeman 1980; Klepper 2001, 2002; Franco 2005). Sometimes this occurs with the blessing of the parent firm and at other times employees leave because they are disgruntled. In either case, the question is how much employees benefit from working for their employers. Some authors have argued that working in small firms gives entrepreneurial advantages to employees because they get to work on a wider variety of tasks, broadening their skill set, gaining procedural knowledge, and perhaps becoming “jacks of all trades” (Lazear 2005; Sorensen 2007). For example, using panel data on job moves by scientists and engineers covering 1995 to 2001, Elfenbein et al. (2010) found that small firms not only generated disproportionate numbers of entrepreneurs but also ones who became successful.

Regarding managerial experience, we postulate that people in managerial positions are more likely to acquire knowledge of selecting, maintaining, and enacting organizational routines that can be effectively reproduced later on. Boeker (1988) showed that the executive teams of startups strongly imprinted their legacy on firms and enhanced the persistence of the structures they created. Indeed, one of a manager’s primary roles is to maintain the operation of organizational routines that have been created by earlier incumbents. Managers also have opportunities to evaluate and select routines from among the most promising ones. Given the interactive nature of performing organizational routines, managerial experience in instructing workers to follow established rules also helps in organizing their emergent ventures’ cooperative behaviors. However, managers often delegate tasks to subordinates and thus they may lose touch with actual routines and practices. Thus, not all managerial experience

is equally valuable. The most valuable experience may result from having authoritative positions that give people opportunities to work on specific tasks relevant to entrepreneurship, rather than just having authoritative positions themselves.

In addition to the studies we have already reviewed, several other studies suggest that knowledge from previous work in the same industry can increase the likelihood of a startup's survival. In their study of unemployed people in Germany who founded firms with government assistance, Dencker et al. (2009) found that pre-entry knowledge from prior work experiences lowered the hazard rate of failure for new ventures, whereas general work experience had no effect. Similarly, using the PSEDII to study the liability of newness among US firms, Yang and Aldrich (2011) found that years of work experience in the same industry as the startup significantly and substantially lowered the hazard of failure, whereas years of managerial experience had no effect. Yang and Aldrich also found that the number of startups created by founders lowered failure rates. From these and other studies, we infer that significant work experience in the same industry as their new venture relieves founders of having to adapt what they have previously learned in other industries to a new context, thus increasing their survival chances.

However, entrepreneurs may bring some outmoded or inappropriate ideas with them to the startup. If the ideas aren't appropriate or are not up to date for the startup's situation, then the new venture begins with a competency trap built into its routines (Levitt and March 1988). By contrast, because startups are not yet working with institutionalized routines, they are not trapped in an outmoded past. With no set routines, the startup might be in a better position to benefit from learning by doing and experimentation as it adapts to feedback from its context.

### 3.3 Business training opportunities

Working as employees and managers gives entrepreneurs direct learning by doing experience with organizational routines that might prove useful in organizing a new firm, but vicarious learning through education and training might also prove useful. In reviewing the importance of knowledge acquisition for entrepreneurs, Chrisman et al. (2005:776) argued that entrepreneurial knowledge can come from many sources, including formal education. Almost all scholars making claims for the impact of knowledge and skills presume that they improve a firm's performance.

Framed in terms of habits and routines, our question is whether education and training can increase nascent entrepreneurs' knowledge to the extent that they do better in building their businesses than people without it. Empirically, the question actually has two parts. First, what is the evidence that education and training do, in fact, create more knowledgeable entrepreneurs? Second, what is the evidence that this knowledge makes entrepreneurs more effective in creating viable businesses? Several authors have looked at programs with built-in project evaluations, using a rigorous standard of assessment: random assignment of people to treatment and control conditions. One example is the Growing America through Entrepreneurship (GATE) program, a three-wave five-year project funded by the Department of Labor, which enrolled people who were interested in starting or growing a business. Although there were slight differences between the experimental and control groups

in starting a business and in business ownership at the first and second waves, by the third wave, the differences were no longer significant (Michaelides and Benus 2010; Fairlie and Holleran 2011). In his summary of the Labor Department report on the same project, Shane (2010a) noted that compared to the control group, the recipients of the entrepreneurship training and assistance did not differ in terms of self-employment income, sales, employees, receiving unemployment benefits, or receiving public assistance benefits.

In his quest for evidence that entrepreneurship education might actually make better entrepreneurs, Shane (2010b) located three international studies of programs in Pakistan, Peru, and Tanzania. All involved interventions designed to improve the economic status of impoverished people with extremely limited access to resources. Karlan and Valdivia (2006) randomly assigned participants in a Peruvian village banking micro-finance program for women to regular training sessions or to normal meetings without training sessions. They reported that the training sessions led to improvements in business practices, knowledge, and revenue. A somewhat similar experiment was conducted by a Norwegian team in Tanzania (Berge et al. 2011). The six-month training improved the performance of the men but not the women and the authors were quite positive in their assessment of the program's human capital effects. Gine and Mansuri (2009), in partnership with the Pakistani Poverty Alleviation Fund, conducted a large randomized field experiment involving over 5000 participants in four different regions of Pakistan. In the human capital part of the experiment, half the participants were randomly assigned to a six day training course whereas the other half were not. Although men benefited more than women, a test of business knowledge showed improvements in both groups.

The distinction between declarative and procedural memory sheds light on the possible shortcomings of purely classroom-based content delivery style entrepreneurial education used in many interventions. First, to the extent that entrepreneurs are starting businesses that require great deal of tacit knowledge and knowledge about complex procedures, classroom instruction that mainly focuses on the “know what” rather than the “know-how” will fall short. Second, if entrepreneurs are instructed as discrete individuals, without others on the startup team also taking part in the training, no transactive memory system is created. Thus, the “know who” aspect of the startup's knowledge base will be deficient.

### 3.3.1 Startup phase: learning “on the job” while creating a startup

In addition to benefitting from heuristics, habits, and routines accumulated from previous work experience, nascent entrepreneurs can benefit by actively working on their ventures—learning by doing—and by experimentation, either deliberate or accidental via trial and error. Theorists have argued that people draw on specific learned social mechanisms as they construct solutions over time to problems found in particular structural contexts, and therefore we need to investigate the *temporal patterns* of social action (Bourdieu 1990; Emirbayer and Mische 1998; Hedström 2005; Gross 2009). To theorize the learning process in the startup phase, we start with a conceptualization of the bundled routines and generic templates required for building viable new ventures. The necessity of dealing with specific procedures and generic

templates reveals the complexities and difficulties involved in developing routines. We then identify the mechanisms that facilitate/impede individuals' learning as they initiate, develop, and eventually establish routines for their new businesses.

### 3.4 Routines taken singly or in bundles

Focusing on how routines are developed highlights an unresolved issue in evolutionary theory concerning an important property of routines that are required for building viable ventures. Previous research has studied routines at different levels: single routines, bundles of routines, or organizations. One line of inquiry, pursued primarily by organizational ecologists and neo-institutional theorists, has focused on organized entities as units of selection. To be a unit of selection, an entity must have the characteristics of a bounded system and have boundary-maintaining processes organized around the persistence of the unit and the perpetuation of its activities. Work groups, departments, divisions, and organizations have this character, although in varying degrees. Routines and competencies may be *bundled* into complementary sets and even tightly coupled at the organizational level. If so, then these bundles drive the fates of the organizations that carry them, rather than routines and competencies taken in isolation (Levinthal 1991). To the extent that founders have espoused schema that spell out in great detail their plans, routines will be more tightly coupled. Nonetheless, as founders and employees perform routines, the ostensive programs implied by an organization's schema may break down, disrupting the "bundled" nature of the set (Rerup and Feldman 2011; Dionysiou and Tsoukas 2013).

The possible bundling of routines and competencies at the subunit and organizational levels poses a daunting problem for entrepreneurs trying to learn by imitation and borrowing. For entrepreneurs observing routines, they not only need to find indicators of routines but also to estimate the joint effects of routines invoked simultaneously and sequentially. Consider the simplest case, when a routine is either "on" or "off." In a unit or organization with  $n$  routines, there will be  $2^n$  possible configurations. Each added routine increases the number of possible configurations exponentially. Working under time and resource constraints, entrepreneurs will have great difficulty in assessing the separate contributions of individual routines they might add to their organizations. In sum, the wide range of seemingly effective routines and their numerous possible combinations pose tremendous challenges for entrepreneurs trying to develop routines.

### 3.5 Adapting cultural templates

Generic cultural templates also need to be taken into account as individuals build organization-specific routines. Pentland (2011:285) noted that routines could be embedded in the technology that a firm purchases, designed by managers, employees, and consultants, imposed on an organization by outside bodies, and developed in-house by trial and error experimentation (Rerup and Feldman 2011). Gorman and Sandefur (2011) pointed out that the codification of what was previously "professional knowledge" has given entrepreneurs access to routines with which they have



no direct experience, especially when that knowledge can be embedded in information technology. Codification of previously tacit knowledge also allows entrepreneurs to outsource routines they would formerly have maintained in-house, thus reducing the burden on their own resources. For example, legal process outsourcing companies have arisen which provide routine legal and paralegal support services to law firms which thus need not re-create such routines themselves.

Once they initiate the organizing process, nascent entrepreneurs encounter contexts in which other people—vendors, investors, employees, customers, regulators, and so forth—already have their own expectations concerning “entrepreneurship.” Such expectations will constrain, to some extent, what entrepreneurs can do. However, those expectations might also educate entrepreneurs by showing them what they are supposed to do, in particular contexts. New institutional theory (NIT) points to the institutional pressures on people and organizations to do “what’s appropriate,” rather than “what works.” In the hard-edged version of NIT, institutional forces severely limit variation even when variation from the norm might help people adapt to local conditions (Meyer 2008). In the kinder and gentler version of NIT, analysts see institutions as less constraining and people as more capable of learning how to flexibly adapt to new circumstances than in the hard-edged version (Scott 2008).

Founders must learn to symbolically represent their new venture as compatible with existing cultural templates (Clarke 2011). In the “cultural codes” view of organizational forms, audiences hold the key to the expectations that organizations must meet. “Researchers must therefore look to the perceptions, beliefs, and actions of contemporaneous audiences for guidance about the default codes relevant to a particular identity” (Hsu and Hannan 2005:476). This view also recognizes that organizations face multiple audiences that might hold different expectations, making founding entrepreneurs’ jobs difficult. If these expectations are floating around in the wider culture, such that any competent adult could learn them, then particular work experiences should not make any difference. If, however, these expectations must be learned on the job, when employees and managers come into personal contact with audiences, then previous experience in the same industry will count for a great deal.

We have identified the collective properties of routines and the required steps required for modifying cultural template for building viable businesses. Because routines and competencies need to be *bundled* into complementary sets and tightly coupled at the organizational level, entrepreneurs need to cope with the tasks of identifying, selecting, and combining principles to succeed the startup phase. Similarly, founders must learn to symbolically represent their new venture as compatible with existing cultural templates and take into account conflict expectations from multiple audiences. Given the complexities and challenges, entrepreneurs must learn by doing, replicating, and experimenting until they eventually develop and establish effective routines. Now we move to a discussion of three learning mechanisms that entrepreneurs could use in the startup phase.

### 3.6 Developing new routines

Regardless of the sources of initial routines, nascent entrepreneurs constructing new organizations without comprehensive blueprints face a situation of efficiently coping

with considerable complexity. (By “blueprint,” we mean the accumulated declarative and procedural knowledge that would enable an experienced entrepreneur to actually build a startup.) Entrepreneurs may bring some knowledge of pre-existing routines with them, especially if they have founded the organization with coworkers. If they attempt to apply ready-made solutions, their dilemma will be how to adapt them to their specific context before they use up the resources from their limited initial endowments. For example, entrepreneurs founding organizations that are part of a network of franchise units can transfer routines from other units, but they will also need to adapt them to local conditions (Darr et al. 1995). If they have no pre-existing routines to adapt, then they face the problem of developing new ones, in contexts that might be unfamiliar to them.

When entrepreneurs are faced with the challenges of developing new routines, many will attempt to follow or imitate templates that others have used, rather than adopting a trial and error approach. We believe that the ecological rationality approach helps us understand why. A simple rule, “imitate the majority in the industry” for choosing organizational routines is ecologically rational if the environment is stable or changes slowly and information search is costly and time-consuming (Boyd and Richerson 2005). Similarly, a simple rule, “imitate the most successful firm in the industry” is ecologically rational when individual learning is slow and information search is costly and time consuming. The principle of ecologically rational cognitive heuristics helps us understand why entrepreneurs often take seemingly irrational shortcuts with regard to knowledge and learning in constructing their startups.

For a business entity that is still on the way to becoming established, founders will probably know the general cultural template provided by the relevant social mechanism for undertaking some activity, but the generic routine will have to be modified to take into account the specific conditions a new firm faces. In their depiction of the ostensive aspects of routines, Pentland and Feldman provided an example of a hiring routine for businesses. Such a routine “involves attracting, screening and choosing applicants. If applicants are chosen, the routine also includes some form of extending an offer and joining up. These concepts are ordered as in” first we attract, then we screen “with the end of the narrative being the successful or unsuccessful hiring of one or more employees” (Pentland and Feldman 2005:796). They did not explain how managers would know how to design such routines, but they implied that generic hiring templates exist in the general business population and thus could be copied from other organizations.

We have argued that habits and emotion play a role in how routines are developed and performed, and hiring routines provide a good example (Cohen 2007). Note that the ostensive hiring routines may say nothing about being dispassionate in responding to applicant characteristics or holding one’s emotions in check when problems arise in interviews. Nonetheless, emotions and habits will be intimately intertwined with how recruiting routines are performed. What will employers do when prospective employees question their authority? If an employer reacts to challenges with an angry and emotional response, then the ostensible hiring routine that called for a calm consideration of an applicant’s qualifications will be undermined. Depending upon how it is enacted, a routine’s ostensive aspects may thus be undermined by its performative aspects.

Thus, the substrate of individual habits underlying organizational routines will affect the way they are actually executed. Some habits will prepare people for their part in enacting organizational routines, such as the habit of self-discipline which facilitates people responding to and completing requests for deadlines in their work. Other habits will potentially weaken people's abilities to enact organizational routines, such as the habit of responding defensively to criticism when teams are debating the advantages and disadvantages of proposed innovations. As with all arguments grounded in evolutionary thinking, such explanations depend upon a consideration of both the action and the context, and so we cannot list a priori a set of "good" and "bad" habits.

### 3.7 Replication and reproduction of routines

Simply developing routines implied by the general social mechanisms will not be sufficient to sustain organizations. Even if founders engage in intentional variations, adaptation is not a certain outcome unless it is sustained through retention mechanisms (Argote and Miron-Spektor 2011). Founders must find the higher-order routines that make lower-order routines replicable and enduring (Pentland et al. 2012), such as through creating and reinforcing organizational schema about an organization's identity and goals. Argote and her colleagues, in a series of studies, have shown that without continual efforts to ensure that routines are being faithfully replicated, they can decay in a matter of months (Argote et al. 1990; Darr et al. 1995). For example, Argote and Ren (2012) noted that experience working together and team training strongly predicted the development of transactive memory systems that preserved organizational knowledge. As a higher-order routine for keeping track of who knows what, a transactive memory system facilitates the reproduction of routines over time and across events.

Salvato and Rerup (2011), arguing for a multilevel approach to understanding organizational routines and capabilities, posited that some organizations develop dynamic capabilities that enable them to alter and improve their routines and competencies. These dynamic capabilities are routines but at a higher order of generality than everyday operating routines. Such higher order routines enable firms to develop new routines and strategies, create knowledge, and avoid unwanted operations. Once the fundamental building blocks of the organization are in place, founders are freed to experiment with innovative practices without fear of undermining the reproduction of already-discovered effective practices. To the extent that nascent entrepreneurs succeed in developing or recognizing such higher order routines, they can improve their life chances.

## 4 Conclusions and implications

In this final section, we take up three issues raised by our examination of the process by which routines emerge in new ventures. First, from a public policy point of view, the millions of startup efforts that are terminated each year could be seen to represent a sizable diversion of societal resources. Can we reduce the gap between the pervasive

cultural appeal of entrepreneurship and the substantial failure rate of startup activities? Second, from a science and innovation policy point of view, entrepreneurs play a vital role in revitalizing the economy. To what extent do emergent entrepreneurial ventures facilitate innovation? Third, what kinds of theory and research should we encourage to pursue these questions?

#### 4.1 Too many entrepreneurs or too many failures?

One could argue that if it weren't for the huge supply of people seeing entrepreneurship as a desirable status, capitalist societies would not have enough new businesses. Thus, capitalist economies succeed only because so many nascent entrepreneurs are waiting in the wings to try their luck. Or, one could argue that fewer nascent entrepreneurs would be needed if the ones who attempted to create new ventures were more skilled and knowledgeable, in keeping with Drucker's (1985) droll observation that most entrepreneurs fail because they simply don't know what they are doing. Many people are attracted to the role of "entrepreneur" and from this point of view, many fail because they don't have the necessary preparation—in our terms, the habits and routines associated with constructing startups—but rather simply have the desire to "be" entrepreneurs. For these people, achieving the identity of "entrepreneur" is not sufficient to deliver the "entrepreneurial knowledge" they need, nor does it seem to guide what they actually do. In short, they are ill-prepared.

What could be done? While the celebration of entrepreneurship produces a large number of startups, cultural codes embedded in social institutions don't give nascent entrepreneurs very much on which to base their actions. Flushing out the shell provided by cultural codes requires entrepreneurs to learn effective habits, apply heuristics appropriately, and learn which routines will work in their firm's industry, according to our review. Educational and training efforts could proceed along several fronts. First, perhaps the celebration of entrepreneurship by the mass media, government agencies, and many programs and nonprofit associations could be tempered with reports on the hard reality of launching a successful startup. Second, educational policy could follow the lead of the Scandinavian countries in pushing education and training in economic knowledge and skills down to the early years in the public school system. Third, labor market policy could promote the programs that encourage employees to seek training in a broad range of skills and encourage employers to offer such training. To some extent, the weakening of traditional expectations concerning stable long-term employment relationships has already put employees in precarious positions where self-employment and entrepreneurship look like attractive alternatives (Kalleberg 2011; Neff 2011). Pursuing such alternatives might be easier if institutional arrangements facilitated the acquisition of entrepreneurial knowledge.

#### 4.2 Emerging ventures as a source of innovation

Paradoxically, what some might see as a wasteful diversion of productive resources into thousands of failed organizing efforts could be seen by others as crucial to capitalist economic systems. Variability lies at the heart of evolution and innovation. To the extent that powerful selection forces inhibit the ability of nascent

entrepreneurs to construct context-dependent responses to problems they encounter, new organizations will look very much like old ones. If time and resource constraints prevent entrepreneurs from learning rapidly enough to enact new solutions, then surviving startups will rely heavily upon knowledge and routines derived from their predecessors. Innovative activity will be severely constrained. By contrast, if selection processes are more forgiving or people better prepared, nascent entrepreneurs have some freedom to adapt solutions from the past to their current situations.

Using the perspective of organizational forms as “blueprints,” we would argue that imperfect, broken, corrupted, fragmented, and otherwise incomplete sets of routines produce high variability across startups. Selection pressures are relentless and unforgiving, but nonetheless many entrepreneurs persist long beyond the point at which it would have made sense to give up, and some who succeed do so because they started when common sense told them they couldn’t succeed and they kept going anyway (Yang and Aldrich 2011). From an evolutionary viewpoint, such heterogeneity constitutes the raw materials on which evolution selection processes operate. Typically, selection pressures on startup attempts simply reproduce existing organizational forms, but occasionally, departures from the norm succeed. For example, in their study of garbage collectors in San Diego, Turner and Fern (2012) noted that when workers were freed from the constraints of working within an established firm and free to pick their opportunities, they were more likely to innovate. Thus, to some extent, innovative organizational forms result from the lack of definitive organizational blueprints.

From this viewpoint, the high churn rate among entrepreneurial ventures in modern economies is simply something we must tolerate. One could ask if more could be done to encourage more innovative entrepreneurship, but our analysis shows how difficult it is to simply construct new organizations, let alone ones that are also innovative. Venture capitalists who make their living by picking successful emerging firms typically succeed no more than one out of 10 times. Indeed, if it is beneficial from a public policy point of view to encourage innovative entrepreneurship, then we must face the reality that it is extremely difficult to recognize potentially successful entrepreneurial ventures a priori.

### 4.3 Selection and adaptation in the emergence of routines

The new paradigm in evolutionary theory emphasizes that selection and adaptation are not separate from one another but rather that adaptation strategies moderate the selection process and shape its outcomes (Levinthal 1991). Previously, selection was seen as caused by forces exogenous to focal organizations and populations, with environmental forces treated as unchangeable by managers and organizations (Aldrich 2008). In contrast, organization theories using an evolutionary approach today treat environments as subject to manipulation and transformation (Aldrich and Ruef 2006). Natural limits constrain resource availability, but social forces and practices also affect access to resources. Thus, the extent to which founding conditions affect the ability of entrepreneurs to learn from feedback has implications for the study of organizational evolution.

From a learning perspective, the study of entrepreneurial actions during the founding process concerns whether humans learn quickly enough to sustain their emerging ventures on a path to stability. Quick learners who enact effective routines go onto the next event in their organization's life course and early adapters may increase between-firm heterogeneity in an industry (Levinthal 1996). By contrast, from a selection perspective, nascent entrepreneurs learning slowly or not at all are more likely to fail and thus the story is one of initial heterogeneity in resources and capability being winnowed over time. Understanding the contributions of habits, heuristics, and learning over the life course gives us insights into how well nascent entrepreneurs cope with the problems involved in building organizational routines, either adapting or being selected out.

Evolutionary theory, as informed by pragmatism (Hodgson 2004; Gross 2009), goes further and sees humans as capable of situated creativity. That is, under certain conditions, humans have the capacity of acting creatively to construct effective solutions to new problems (Baker et al. 2003). Humans, behaving pragmatically and using their ecological rationality (Goldstein 2009), can construct routines that more closely fit local environments than the old routines available to them. We think it is an empirical question as to whether the survival of startups is a result of prior habits, heuristics, and routines, locally adaptive behaviors, or some complex combination of the two. That is, constrained by habits, heuristics, and existing routines, to what extent can entrepreneurs acting pragmatically adopt, replicate, modify, and create organizational structures to fit local conditions. To pursue this question, we need trend data following entrepreneurs from their early life stages, and process-oriented research projects designed to collect dynamic data on emergent ventures from their very early days.

## References

- Abell P, Felin T, Foss N (2008) Building micro-foundations for the routines, capabilities, and performance links. *Manag Decis Econ* 29(6):489–502
- Aldrich HE (2008) *Organizations and environments*, new edition. Stanford Business Classics of Stanford University Press, Stanford
- Aldrich HE, Kim PH (2007) A life course perspective on occupational inheritance: selfemployed parents and their children. In: Ruef M, Lounsbury M (eds) *Research in the sociology of organizations*, vol 25. JAI Press Elsevier, Oxford, pp 33–82
- Aldrich HE, Ruef M (2006) *Organizations evolving*. Sage Publications, London
- Argote L, Miron-Spektor E (2011) Organizational learning: from experience to knowledge. *Organ Sci* orsc.1100.0621
- Argote L, Ren Y (2012) Transactive memory systems: a microfoundation of dynamic capabilities. *J Manag Stud* 49(8):1375–1382
- Argote L, Beckman SL, Epple D (1990) The persistence and transfer of learning in industrial settings. *Manag Sci* 36(2):140–154
- Arrow KJ (1962) The economic implications of learning by doing. *Rev Econ Stud* 29:155–173
- Arum R, Mueller W (2004) *The reemergence of self-employment: a comparative study of self-employment dynamics and social inequality*. Princeton University Press, Princeton
- Audretsch DB, Aldridge TT, Sanders M (2011) Social capital building and new business formation: a case study in silicon valley. *Int Small Bus J* 29(2):152–169
- Baker T, Miner AS, Easley DT (2003) Improvising firms: bricolage, account giving and improvisational competencies in the founding process. *Res Policy* 32(2):255–276

- Bapuji H, Hora M, Saeed AM (2012) Intentions, intermediaries, and interaction: examining the emergence of routines. *J Manag Stud* 49(8):1586–1607
- Bargh JA, Williams EL (2006) The automaticity of social life. *Curr Dir Psychol Sci* 15(1):1–4
- Baron RA (2008) The role of affect in the entrepreneurial process. *Acad Manag Rev* 33(2):328–340
- Becker HS (1991) Children's conceptions of money: concepts and social organization. In: Maines D (ed) *Social organization and social process*. Aldine, Chicago, pp 45–47
- Becker MC, Lazaric N (eds) (2009) *Organizational routines: advancing empirical research*. Edward Elgar, Cheltenham
- Becker MC, Lazaric N, Nelson RR, Winter SG (2005) Applying organizational routines in understanding organizational change. *Ind Corp Chang* 14(5):775–791
- Beckman CM, Haunschild PR (2002) Network learning: the effects of partners' heterogeneity of experience on corporate acquisitions. *Admin Sci Q* 47(1):92–124
- Berge LO, Bjorvatn K, Tungodden B (2011) Human and financial capital for micro-enterprise development: evidence from a field and lab experiment. In: CMI working papers. Chr. Michelsen Institute, Bergen
- Blanchflower DG, Oswald A, Stutzer A (2001) Latent entrepreneurship across nations. *Eur Econ Rev* 45(4–6):680–691
- Boeker W (1988) Organizational origins: entrepreneurial and environmental imprinting at the time of founding. In: Carroll GR (ed) *Ecological models of organization*. Ballinger, Cambridge, pp 33–51
- Bouchard TJJ, McGue M (2003) Genetic and environmental influences on human psychological differences. *J Neurobiol* 54(1):4–45
- Bourdieu P (1990) *The logic of practice*. Stanford University Press, Stanford
- Boyd R, Richerson PJ (2005) *The origin and evolution of cultures*. Oxford University Press, New York
- Brittain J, Freeman JH (1980) Organizational proliferation and density dependent selection. In: Kimberly JR, Miles RH (eds) *The organizational life cycle*. Jossey-Bass, San Francisco, pp 291–338
- Caliendo M, Fossen FM, Kritikos AS (2011) Personality characteristics and the decision to become and stay self-employed. In: SOEP papers on multidisciplinary panel data research. Deutsches Institut für Wirtschaftsforschung, Berlin
- Campbell DT (1969) Variation and selective retention in socio-cultural evolution. *Gen Syst* 14:69–85
- Chrisman JJ, McMullan E, Hall J (2005) The influence of guided preparation on the long-term performance of new ventures. *J Bus Ventur* 20(6):769–791
- Clarke J (2011) Revitalizing entrepreneurship: how visual symbols are used in entrepreneurial performances. *J Manag Stud* 48(6):1365–1391
- Cohen MD (2007) Reading dewey: reflections on the study of routine. *Organ Stud* 28(5):773–786
- Cohen MD (2012) Perceiving and remembering routine action: fundamental micro-level origins. *J Manag Stud* 49(8):1383–1388
- Cohen MD, Burkhart R, Dosi G, Egidi M, Marengo L, Warglien M, Winter S (1996) Routines and other recurring action patterns of organizations: contemporary research issues. *Ind Corp Chang* 5(3):653–698
- Darr EL, Argote L, Eppler D (1995) The acquisition, transfer, and depreciation of knowledge in service organizations: productivity in franchises. *Manag Sci* 41(11):1750–1762
- Deakins D, Freel M (1998) Entrepreneurial learning and the growth process in SMEs. *Learn Organ* 5(3):144–155
- Dencker JC, Gruber M, Shah SK (2009) Pre-entry knowledge, learning, and the survival of new firms. *Organ Sci* 20(3):516–537
- Dionysiou D, Tsoukas H (2013) Understanding the (re)creation of routines from within: a symbolic interactionist perspective. *Acad Manag Rev* 38(2):181–205
- Drucker PE (1985) *Innovation and entrepreneurship: practice and principles*. Harper & Row, New York
- Elder GH, Johnson MK, Crosnoe R (2006) The emergence and development of life course theory. In: Mortimer J, Shanahan M (eds) *Handbook on the life course*. Springer, New York, pp 3–24
- Elfenbein DW, Hamilton BH, Zenger TR (2010) The small firm effect and the entrepreneurial spawning of scientists and engineers. *Manag Sci* 56(4):659–681
- Emirbayer M, Mische A (1998) What is agency? *Am J Sociol* 103(4):962–1023

- Fairlie R, Holleran W (2011) Entrepreneurship training, risk aversion and other personality traits: evidence from a random experiment. In: Duke/Kauffman entrepreneurship conference. Durham North Carolina
- Forbes DP (2005) Are some entrepreneurs more overconfident than others? *J Bus Ventur* 20(5):623–640
- Franco A (2005) Employee entrepreneurship: recent research and future directions. In: Alvarez S, Agarwal R, Sorenson O (eds) *Handbook of entrepreneurship research: interdisciplinary perspectives*. Springer, New York, pp 81–96
- Gathmann C, Schoenberg U (2007) How general is human capital? A task-based approach. In: IZA discussion papers. Institute for the study of labor, Bonn
- Gavetti G (2005) Cognition and hierarchy: rethinking the microfoundations of capabilities' development. *Organ Sci* 16(6):599–617
- Gavetti G, Levinthal D (2000) Looking forward and looking backward: cognitive and experiential search. *Adm Sci Q* 45(1):113–137
- Gigerenzer G, Selten R (eds) (2001) *Bounded rationality: the adaptive toolbox*. MIT Press, Cambridge
- Gine X, Mansuri G (2009) Constraints to female entrepreneurship: ideas or capital. In: WB-IFC-Kauffman foundation conference on entrepreneurship and growth
- Goldstein DG (2009) Heuristics. In: Hedstrom P, Bierman P (eds) *The Oxford handbook of analytical sociology*. Oxford University Press, New York, pp 140–167
- Gorman EH (2006) Work uncertainty and the promotion of professional women: the case of law firm partnership. *Soc Forces* 85(2):865–890
- Gorman EH, Sandefur RL (2011) “Golden age”, quiescence, and revival: how the sociology of professions became the study of knowledge-based work. *Work Occup* 38(3):275–302
- Goss D (2005) Schumpeter's legacy? Interaction and emotions in the sociology of entrepreneurship. *Entrep Theory Pract* 29(2):205–218
- Gross N (2009) A pragmatist theory of social mechanisms. *Am Sociol Rev* 74(3):358–379
- Haunschild PR (1993) Interorganizational imitation: the impact of interlocks on corporate acquisition activity. *Adm Sci Q* 38(4):564–592
- Hedström P (2005) *Dissecting the social: on the principles of analytical sociology*. Cambridge University Press, New York
- Hedstrom P, Udehn L (2009) Analytical sociology and theories of the middle range. In: Hedstrom P, Bierman P (eds) *The Oxford handbook of analytical sociology*. Oxford University Press, New York, pp 25–47
- Hodgson GM (2004) *The evolution of institutional economics*. Routledge, London
- Hodgson GM (2009) The nature and replication of routines. In: Becker MC, Lazaric N (eds) *Organizational routines: advancing empirical research*. Edward Elgar, Cheltenham, pp 26–44
- Hsu G, Hannan MT (2005) Identities, genres, and organizational forms. *Organ Sci* 16(5):474–490
- Jovanovic B (1982) Selection and the evolution of industry. *Econometrica* 50(3):649–670
- Kalleberg A (2011) *Good jobs, bad jobs: the rise of polarized and precarious employment system in the United States, 1970s to 2000s*. Russell Sage Foundation
- Karlan D, Valdivia M (2006) Teaching entrepreneurship: impact of business training on microfinance clients and institutions. In: Economic growth center. Yale University, New Haven
- Kelley DJ, Bosma N, Amoros JE (2011) *Global entrepreneurship monitor: 2010 global report*. Global Entrepreneurship Research Association, Babson Park
- Kim PH, Aldrich HE (2011) Are we there yet? Measurement challenges in studying new ventures. In: Klyver K, Hindle K (eds) *Handbook of research on new venture creation*. Edward Elgar, Cheltenham, pp 185–193
- Klepper S (2001) Employee startups in high-tech industries. *Ind Corp Chang* 10(3):639–674
- Klepper S (2002) The capabilities of new firms and the evolution of the US automobile industry. *Ind Corp Chang* 11(4):645–666
- Koellinger P, Minniti M, Schade C (2007) I think i can, i think i can: overconfidence and entrepreneurial behavior. *J Econ Psychol* 28(4):502–527
- Kohn ML, Slomczynski KM, Schoenbach C (1986) Social stratification and the transmission of values in the family: a cross-national assessment. *Sociol Forum* 1(1):73–102
- Latour B (1986) The powers of association. In: Law J (ed) *Power, action, and belief: a new sociology of knowledge*. Routledge and Kegan Paul, London, pp 264–280
- Lazear EP (2005) Entrepreneurship. *J Labor Econ* 23(4):649–680



- Levie J, Gavin D, Leleux B (eds) (2011) The new venture mortality myth. Handbook of research on new venture creation. Edward Elgar Publishing Limited, Cheltenham
- Levinthal D (1991) Organizational adaptation and environmental selection—interrelated processes of change. *Organ Sci* 2(1):140–145
- Levinthal D (1996) Learning and schumpeterian dynamics. In: Malerba F, Dosi G (eds) *Organization and strategy in the evolution of enterprise*. Macmillan, London, pp 27–41
- Levitt B, March JG (1988) Organizational learning. *Annu Rev Sociol* 14(1):319–338
- Loasby BJ (2007) A cognitive perspective on entrepreneurship and the firm. *J Manag Stud* 44(7):1078–1106
- Meyer JW (2008) Reflections on institutional theories of organizations. In: Greenwood R, Oliver C, Suddaby R, Sahlin K (eds) *The sage handbook of organizational institutionalism*. Sage, Los Angeles, pp 790–811
- Michaelides M, Benus J (2010) Are self-employment training programs effective? Evidence from Project GATE. In: MPRA working paper series. Munich
- Miller KD, Pentland BT, Choi S (2012) Dynamics of performing and remembering organizational routines. *J Manag Stud* 49(8):1536–1558
- Miner AS, Gong Y, Baker T, O'Toole J (2011) How does TMT prior experience shape strategy? A routine-based framework based on evidence from founding teams. In: Carpenter M (ed) *The handbook of research on top management teams*. Edward Elgar, Cheltenham, pp 189–213
- Mungai E, Velamuri SR (2011) Parental entrepreneurial role model influence on male offspring: is it always positive and when does it occur? *Entrep Theory Pract* 35(2):337–357
- Murmann JP (2003) Knowledge and competitive advantage: the coevolution of firms. *Technology and National Institutions* Cambridge. Cambridge University Press, UK
- Neff G (2011) *Venture labor*. MIT Press, Boston
- Nelson RR, Winter SG (1982) *An evolutionary theory of economic change*. Belknap Press of Harvard University Press, Cambridge
- Ostrom V (1980) Artisanship and artifact. *Public Adm Rev* 40(4):309–317
- Pentland BT (2011) The foundation is solid, if you know where to look: comment on felin and foss. *J Inst Econ* 7(Special Issue 02):279–293
- Pentland BT, Feldman MS (2005) Organizational routines as a unit of analysis. *Ind Corp Chang* 14(5):793–815
- Pentland BT, Feldman MS, Becker MC, Liu P (2012) Dynamics of organizational routines: a generative model. *J Manag Stud* 49(8):1484–1508
- Phillips DJ (2005) Organizational genealogies and the persistence of gender inequality: the case of silicon valley law firms. *Adm Sci Q* 50(3):440–472
- Podolny JM (1993) A status-based model of market competition. *Am J Sociol* 98(4):829–872
- Polanyi M (1966) *The tacit dimension*. Doubleday, Garden City
- Rerup C, Feldman MS (2011) Routines as a source of change in organizational schemata: the role of trial and error learning. *Acad Manag J* 54(3):577–610
- Sadeghi A (2008) The births and deaths of business establishments in the United States. *Mon Lab Rev* 131(12):3–18
- Salvato C, Rerup C (2011) Beyond collective entities: multilevel research on organizational routines and capabilities. *J Manag* 37(2):468–490
- Schumpeter JA (1934) *The theory of economic development; an inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press, Cambridge
- Scott WR (2008) Approaching adulthood: the maturing of institutional theory. *Theory Soc* 37(5):427–442
- Shane S (2010a) Stop trying to turn the unemployed into entrepreneurs. *Small business trends* retrieved May 2, 2011, from <http://smallbiztrends.com/2010/11/stop-trying-to-turn-the-unemployment-into-entrepreneurs.html>
- Shane S (2010b) Does entrepreneurship education make people better entrepreneurs? *small business trends*. Retrieved May 2, 2011, from <http://smallbiztrends.com/2010/09/does-entrepreneurship-education-make-people-better-entrepreneurs-2.html>
- Simon HA, Chase WG (1973) Skill in chess. *Am Sci* 61(4):394–403
- Sitkin SB (1992) Learning through failure: the strategy of small losses. In: Staw BM, Cummings LL (eds) *Research in organizational behavior*, vol 14. JAI Press, Greenwich, pp 231–266

- Sorensen JB (2007) Bureaucracy and entrepreneurship: workplace effects on entrepreneurial entry. *Adm Sci Q* 52(3):387–412
- Sørensen JB, Fassiotta MA (2011) Organizations as fonts of entrepreneurship. *Organ Sci* 22(5):1322–1331
- Todd PM, Gigerenzer G, Group AR (2012) *Ecological rationality: intelligence in the world*. Oxford University Press, Oxford
- Turner SF, Fern MJ (2012) Examining the stability and variability of routine performances: the effects of experience and context change. *J Manag Stud* 49(8):1407–1434
- Tversky A, Kahneman D (1981) The framing of decisions and the psychology of choice. *Science* 211(4481):453–458
- Van de Ven AH, Engleman RM (2004) Event- and outcome-driven explanations of entrepreneurship. *J Bus Ventur* 19(3):343–358
- Webley P (2005) Children's understanding of economics. In: Barrett M, Buchanan-Barrow E (eds) *Children's understanding of society*. Psychology Press, Hove, pp 43–67
- Wood W, Quinn JM, Kashy D (2002) Habits in everyday life: thoughts, emotions, and action. *J Personal Soc Psychol* 83(6):1281–1297
- Yang T, Aldrich H (2011) All organizations were once new: revisiting stinchcombe's liability of newness hypothesis University of North Carolina-Chapel Hill
- Zollo M, Winter SG (2002) Deliberate learning and the evolution of dynamic capabilities. *Organ Sci* 13(3):339–351