Timely creation of new organizations

- Imprinting effects of entrepreneurs' initial founding decisions

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Abstract
In an attempt to explain why some new organizations are established faster than others we adopted a perspective according to which a timely organizational emergence can be understood and predicted by viewing it as conditioned by the initial decisions of nascent entrepreneurs regarding the opportunities they pursue. Using a large dataset of individuals who are in the process of building their ventures in the United States, and who have been followed up on an annual basis as they go through this process, we have found empirical evidence to conclude that initial opportunity characteristics exercise imprinting effects on the time it takes to create new organizations. That is, our empirical observations provide evidence that the characteristics of emerging ventures at the intersection of pursued opportunities and individual entrepreneurs have an impact on the time it takes to establish a new organization. Given the novelty of the relationships investigated in this study, coupled with the empirical support for some of our hypotheses, we believe our findings can shed new light on the understanding of imprinting forces for timely organization creation.

Key words:
Organizational emergence; Individual-opportunity nexus, Timely organization creation, PSED
INTRODUCTION

The nexus of enterprising individuals and valuable opportunities is central to entrepreneurship as a scholarly field (Venkataraman, 1997). This requires scholars to pay attention to nascent entrepreneurs – individuals who are in the process of starting up new ventures – and the role of opportunities to explain the emergence of new organizations (Eckhardt & Shane, 2003), and to move entrepreneurship research forward (Busenitz et al., 2003). While these ideas were first put forward several years ago, Davidsson and Gordon (2012) observed that even today very few studies focus on the opportunity or the individual-opportunity nexus. To address these issues we investigate how the initial decisions of nascent entrepreneurs regarding the kinds of opportunities they pursue affect the speed of new organization creation, a process called organizational emergence (e.g. Gartner, Bird, & Starr, 1992; Katz & Gartner, 1988). In this study, opportunity refers to the possibility of introducing a new product or service to the market (cf. Hansen, Shrader, & Monllor, 2011).

Several theoretical and practical concerns make organizational emergence an important entrepreneurial event. At any one time, about one person out of ten is involved in nascent entrepreneurial activities in the United States, yet only some of these efforts culminate in the emergence of a viable, new business (Reynolds, 2007). According to Katz and Gartner (1988), organizations come to exist when they demonstrate intention, establish boundaries, acquire resources, and engage in exchanges. Therefore, organizations that emerge are those that move successfully from gestation to infancy to become viable and self-sustaining (Reynolds, 1994).

Achieving these indicators of organizational emergence, however, takes time; the median time for a new firm birth in the United States is 19-24 months (Reynolds, 2007). Since opportunities have “windows”, which are open until competitors react on them (e.g. Shepherd & Levesque, 2002), economic value may be lost if development times are longer (Gilman, 1982).
Carter, Gartner, and Reynolds (1996) went as far as arguing that individuals that took longer than a year to set up their nascent venture were unlikely to ever see their venture realized. By speeding up the organizational emergence process a nascent entrepreneur can gain, for example, financial independence and legitimacy (Schoonhoven, Eisenhardt, & Lyman, 1990), and competitive advantage (Lieberman & Montgomery, 1988; Sonnenberg, 1993). Therefore, the speed of concepts moving to market is a fundamental issue facing emerging organizations (Utterback et al., 1992).

Despite the empirical observation that the time it takes to create a business varies from one effort to another (Reynolds, 2007), little is known about factors that affect the speed to startup once a nascent entrepreneur enters the firm creation process. Most literature on the processes of nascent entrepreneurship has simply studied outcomes such as whether a new firm gets started or whether an entrepreneur quits the process (e.g. Delmar & Shane, 2004; Brush, Edelman & Manolova, 2008; Edelman & Yli-Renko, 2010; Van Gelderen, Thurik & Patel, 2011); little attention has been paid to when these important milestones are achieved or what could accelerate the process of emergence.

Interestingly, initial founding decisions have significant consequences on the subsequent development of new ventures (e.g. Beckman & Burton, 2008; Colombo & Piva, 2012; Doutriaux, 1992; Nerkar & Shane, 2008). For example, a decision regarding the industry (competitive environment) a new venture will enter will most likely have immediate, substantial performance implications (Bamford, Dean, & McDougall, 1999). Choices made at the point of inception have a significant impact on new venture development well beyond the formation (Bamford, Dean, & Douglas, 2004). Indeed, it has been suggested, and empirically shown, that
initial founding conditions have *imprinting* effects on organizations over the long run (e.g. Boeker, 1988, 1989; Kimberly, 1975, 1979; Pennings, 1980; Tucker, Singh, & Meinhard, 1990).

In this study, we are interested in investigating the decisions of nascent entrepreneurs concerning the opportunity they decide to pursue, how these decisions imprint the subsequent firm creation process, and how they influence the speed to organizational emergence. Applying the concept of imprinting, our objective is to investigate the kinds of imprinting effects that early decisions of nascent entrepreneurs regarding the opportunity have on the speed to organizational emergence. We define speed to organizational emergence as the time taken from the inception of the business idea to the organization existing as an independent entity (cf. Capelleras & Greene, 2008). Our study aims to make two contributions.

First, since nascent entrepreneurs and their ventures (Capelleras, Greene, Kantis, & Rabetino, 2010; Capelleras & Greene, 2008; Schoonhoven et al. 1990) as well as the overall economy (Birch 1987; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2002) can benefit from speeding up of the firm creation process, the central interest of our study is related to the speed of progress in organization creation. This is a novel approach among studies related to nascent entrepreneurial activities, which generally focus on performance criteria such as (expected) profits and sales (Brush et al., 2008; Cassar, 2010; Delmar & Shane, 2006) or survival of the startup effort (Delmar & Shane, 2004; Parker & Belghitar, 2006; Van Gelderen et al., 2011). We expand this literature on nascent entrepreneurship by focusing on the timing of the key indicators of organizational creation (how fast/slow nascent entrepreneurs succeed in creating operative organizations), hence aligning our study with previous research suggesting that time is an important dimension of the entrepreneurial process (Baron, 1998; Bird, 1992), and answering to
the Busenitz and colleagues’ (2003) call to better understand why some entrepreneurs are able to act more quickly than others in the venture creation process.

Second, while the current trends in entrepreneurship literature promote the idea that the activities and behaviors of nascent entrepreneurs define the outcome of the organizational emergence process (cf. Carter, Gartner, & Reynolds, 1996; Delmar & Shane, 2004; Tornikoski & Newbert, 2007; Tornikoski & Puhakka, 2009), we focus on the initial characteristics of opportunities and their role in explaining the emergence of operative organizations. The challenge we face is to know whether and to what extent the initial characteristics of opportunities have any universal (across industries and different types of ventures) role in explaining the pace of firm creation. Even if this role would be small, it would be very informative for aspiring nascent entrepreneurs because they are the ones who make the initial decisions to pursue certain types of opportunities and not others. Along this line of thinking, we focus on those initial characteristics of opportunities and nascent ventures built in their pursuit that have to do with novelty. New business opportunities vary in their degree of novelty in a subjective (new to the entrepreneur) as well as more objective (new to markets, new technologies) sense (Shepherd, Douglas, & Shanley, 2000). The impact of novelty on new firm performance remains largely contested (e.g., Amason, Shrader, & Tompson, 2006; Jennings, Jennings, & Greenwood, 2009; Shepherd et al., 2000), and our empirical study will shed new light on this topic.

The rest of this paper is organized as follows. The second section will review the imprinting literature to the point that we can identify the core propositions of the theory and present a model for empirical investigation. The third section will lay out the methodology of our
study. The fourth section will present the results, while in the fifth section we will discuss the
results and their implications to practice and research on organizational emergence.

THEORY AND HYPOTHESES

Katz and Gartner (1988) suggested four organizational markers as indicators that an
organization is in the process of coming into existence: intention, resources, boundary, and
exchanges. It has been argued that the achievement of these organizational markers in timely
fashion helps to achieve financial independence, gain external visibility and legitimacy, and
increase survival chances (Schoonhoven, Eisenhardt, & Lyman, 1990). Some scholars go even
further to suggest that nascent entrepreneurs should pursue opportunities aggressively in the
short term to learn quickly whether the opportunity is worthy of start-up or a poor choice that
should be abandoned (Carter, Garner, & Reynolds, 1996). Even if a nascent entrepreneur would
decide not to aggressively pursue an opportunity he/she should be aware, at a minimum, that
opportunity windows are only open until competitors will decide to pursue them (Shepherd &
Levesque, 2002). All this suggests that time is crucial for nascent entrepreneurs in their quest to
create new organizations.

Given that new enterprises are an important source of innovations and an engine of
economic growth, speeding up the gestation and emergence of viable new organizations may
also be desirable from a macroeconomic perspective (Birch, 1987; Djankov et al., 2002).
However, while timing of strategic actions by existing firms has been widely studied in strategic
management literature (e.g. Barr & Huff, 1997; Nadkarni & Barr, 2008), we know little about
time in the context of organizational emergence. Observations from a panel study of nascent
entrepreneurs in the US demonstrate that by 36 months from the first start-up activity taking
place, 75% of nascent entrepreneurs report an ongoing business (self-report). Ten percent of
startups actually take over 60 months to create (Reynolds, 2007). Looking at the time elapsed between the first event to the last event in the gestation period (regardless of whether the nascent entrepreneur himself considered the business operating or not), Liao, Welsch, & Tan, (2005) report that the median duration of the firm gestation period is 32 months, or 2 years and 8 months.

While existing literature has little to say about the factors specifically affecting startup speed, research on initial founding conditions has shown that these conditions, by and large, imprint the subsequent development and performance of new ventures and organizations in general (Boeker, 1988; Kelley & Rice, 2001; Kimberly, 1975; Lawrence, 1984). Milanov and Fernhaber (2009) trace the notion of imprinting back to Stinchcombe (1965), who argued that a new organization’s subsequent performance is significantly affected by conditions and events surrounding its founding. In essence, the decisions made by nascent entrepreneurs at the formative stage of an organization have lasting effects that imprint the organization and impact its performance (Bamford et al., 1999). As a consequence, imprinting in new organizations can be understood as an agent-driven process (Johnson, 2007): It is through the efforts and decisions of nascent entrepreneurs that emerging organizations acquire the elements from their contexts that, should they persist, are often asserted to have been “imprinted” at founding (Johnson, 2007).

To understand the mechanisms behind the imprinting effects on speed to new firm emergence, two accounts are worth of consideration. On the one hand, the conditions and events surrounding organizations’ founding fix organizations to developmental trajectories (Boeker, 1989) from which it will be difficult to deviate due to the tendency to preserve rather than change initial strategies and configurations (Miller & Friesen, 1984; Quinn, 1980). While
individuals face a number of possibilities in the beginning of organizational processes, once they start to make decisions and engage in actions, these initial choices trigger further actions, which accumulate in an organizational path (Sydow, Schreyögg, & Koch, 2009). That is, once a nascent entrepreneur decides to pursue a certain kind of opportunity, the characteristics of the opportunity fix his/her emerging organization to a defined development path.

On the other hand, at the individual level, people have the propensity to persist with certain courses of action, even in situations where negative feedback exists and there is uncertainty about the plausibility of future success (Staw, 1976). Indeed, entrepreneurs’ tendency to believe that they can control their own destinies makes them overly optimistic, which contributes to heavy personal commitments, which in turn can lead to inability to make adjustments during the venturing process (Cooper, Woo, & Dunkelberg, 1988). As such, nascent entrepreneurs have a tendency to stick with their initial convictions and plans rather than change them during the venturing process.

In order to understand how initial founding decisions of nascent entrepreneurs impact the speed to organizational emergence, and echoing Shepherd, Douglas & Shanley (2000), we next focus our attention on three aspects of opportunities over which entrepreneurs have control at the formative stages of an organization, namely familiarity to the entrepreneur, novelty to the market, and novelty in technology. While the entrepreneur’s familiarity with the opportunity domain is important for accurate and timely decision making, it is the technological novelty and novelty in customers’ eyes that capture the external boundaries of the opportunity domain.

**Familiarity to entrepreneur**

Entrepreneurs’ cognitive frameworks, through which they interpret the perceived opportunities and environment (Baron, 1998), are likely to give rise to unique insights when
entrepreneurs operate in domains that are familiar to them. There are multiple theoretical perspectives, reviewed next, that inform our understanding of why the decisions to pursue opportunities familiar to nascent entrepreneurs are important for the early development and imprinting of emerging organizations.

Human capital theory maintains that knowledge provides individuals with increases in their cognitive abilities, leading to more productive and efficient activities (Becker, 1964). Overall, previous research tends to support the existence of a positive relationship between human capital and entrepreneurial activity (Davidsson & Honig, 2003); once engaged in the entrepreneurial process, individuals with high levels of human capital should have a superior ability to successfully exploit opportunities. In recent studies of new ventures in Spain and South America, researchers have found that those entrepreneurs with previous experience in the same industry report (retrospectively) faster venture creation speed (Capelleras & Greene, 2008; Capelleras et al. 2010). Indeed, experiencing and observing a number of development projects in an industry leads to learning-curve effects, which in turn should shorten the development times in the individual’s subsequent new ventures (Schoonhoven et al., 1990).

In line with recent research on entrepreneurial cognition and opportunity recognition (Baron, 1998; Baron & Ensley, 2006; Shane, 2000), we believe that previous knowledge of the opportunity domain is important for a nascent entrepreneur’s pursuit of an opportunity. Prior experience may be needed for the recognition of the opportunity itself (Shane, 2000), but it should also lead to faster decision-making and execution by enabling entrepreneurs to process information more efficiently and avoiding mistakes that individuals without the same experience would make (Capelleras & Greene, 2008). Also, whether an entrepreneur’s previous experience in the opportunity domain is from years ago, based on hobbies or academic research, or based on
current employment, is not a trivial question. Even less-than-dynamic industries today are moving forward at a fast pace, yet alone the speed of developments in more technologically advanced industries. It may well be that the more current the nascent entrepreneur’s experiences in the opportunity domain – that is, the more familiar entrepreneur is with the current, commercial industry developments in the field of the opportunity – the more the startup process will speed up as a result of their social network connections, knowledge of customers and markets, and knowledge of ways to serve markets.

Furthermore, when considering investing in emerging organizations, resource holders generally use experience and education as proxies for nascent entrepreneur’s different abilities, such as problem solving skills. It is assumed, for example, that earlier tacit knowledge deriving from experience in similar industry, start-up firms, managerial positions, large firms, or small firms would lead to more knowledgeable actions and decisions in the firm creation process (Gimmon & Levie, 2010; Hsu, 2007), which in turn would speed up the emergence process. Even when entrepreneurs are unable to create long-lasting firms, their efforts are rewarded by the acquisition of unique knowledge that can be used in subsequent founding attempts (Aldrich & Martinez, 2001). Therefore, external audiences tend to think that the experiential qualities of a nascent entrepreneur will help to overcome non-anticipated problems and capitalize on new windows of opportunities that can open during the firm emergence process and beyond. Acquiring external funding is an important element of organizational emergence for many firms (Reynolds & Miller, 1992; Tornikoski & Newbert, 2007), and business angels as well as venture capitalists may be willing to speed up the funding decisions if an opportunity is presented by an experienced entrepreneur.
Finally, whether a nascent entrepreneur’s familiarity with the opportunity domain is based on their current employment or a previous job may also have important implications for the opportunity costs of venturing. Individuals weigh their participation in a start-up venture in terms of opportunity cost of, particularly, their present employment (Douglas & Shepherd, 2000). Those who are willing to make the leap from an existing job in the same industry to starting up their own business may be particularly committed to their business opportunities, while being also particularly familiar with the current industry. This is yet another reason to expect that such nascent entrepreneurs intimately familiar with the opportunity domain would be likely to speed up the startup process and avoid wasting time (hence bringing their opportunity cost down). Combined, the arguments presented above lead us to the first hypothesis:

**Hypothesis 1:** The better aligned the new business opportunity is with the current knowledge base of the nascent entrepreneur, the faster the speed of organizational emergence.

**Novelty to market**

Novelty to market concerns the degree to which customers are uncertain about the new venture and its offerings (Shepherd et al., 2000). While all new, independent ventures are novel to the markets, their degree of market novelty varies (Shepherd et al. 2000; Stinchcombe, 1965). Most entrepreneurs decide to start new businesses based on imitative business ideas that introduce only incremental improvements over competitors’ offerings (Reynolds, 2007); such ventures face only limited market novelty. However, those nascent entrepreneurs that decide to introduce products or services unlike those currently in the market are likely to face considerable demand uncertainty (Knight, 1921); they are characterized by high levels of market novelty. Such uncertainty has potential to slow down the pace of new venture creation for two interrelated reasons.
First, market knowledge is one of those necessary resources needed for exploitation of entrepreneurial opportunities (e.g. Chrisman & McMullan, 2000). However, potential customers of a new venture have limited domains of expertise and may be unable to articulate their underlying needs (Hamel & Prahalad, 1991). When markets are hard to identify and research, and when potential customers are unfamiliar with the kind of offering that the nascent entrepreneur is pursuing, the nascent entrepreneur himself may get discouraged in the absence of positive early market feedback. For example, based on data collected from high technology ventures, Choi and Shepherd (2004) found that entrepreneurs were more likely to exploit opportunities when they perceived more knowledge of customer demand for the product. In case of a new-to-the-market kind of offering, a nascent entrepreneur may have to spend more time researching the market, and may also receive unfavorable signals from the early market regarding the potential of her offering. Both of these processes can lead to delays in building an operative business.

Furthermore, an opportunity that is truly novel in the marketplace may require the nascent entrepreneur and their team to spend time on educating both buyers as well as other key stakeholders (employees, funders) before organizational milestones, such as first sales or external funding can be achieved. The troubles that Howard Schultz faced when trying to raise early funding for Starbucks, for example, can be attributed to the market novelty of the opportunity itself: The concept of premium coffee and a “third-place” experience were so unfamiliar to the investors that even if they believed in the skills of the passionate entrepreneur, they shied away from the investment opportunity (Schultz & Yang, 1999). Indeed, uncertain market and industry conditions can make it significantly more difficult for an entrepreneur to
secure external funding (MacMillan, Siegel, & Subba Narasimba, 1985; Mason & Stark, 2004). For these reasons, our second hypothesis is as follows:

**Hypothesis 2**: The more novel the solution created to address the business opportunity is to the markets, the slower the speed of organizational emergence.

**Novelty in technology**

Novelty in technology concerns the extent to which the technology used by the new venture is similar to the technologies that already exist out in the market (cf. Shepherd et al., 2000). The nature of technology itself is important for its commercialization (Nerkar & Shane, 2008). Because technological novelty and innovation in general are subject to rapid depreciation –the window of opportunity is constantly shrinking –time is a scarce resource (Lawrence & Anderson, 1996) and speed becomes essential (Abell, 1978; Markman, Gianiodis, Phan, & Balkin, 2005). As such, nascent entrepreneurs’ decisions to pursue opportunities involving technological novelty may not only give their new organizations competitive advantages (Barney, 1991) but also impact the speed to organizational emergence.

Even though nascent entrepreneurs need to commercialize technological innovations faster than their competitors, the mere fact that the opportunity involves technological novelty may slow down the speed to emergence. This is because more sophisticated ventures may require more time and resources to complete the start-up process (Reynolds & Curtin, 2011). Also, generally a new solution has to go through extensive testing before institutional approval, for example in medical and biotechnological fields. More generally, Schoonhoven, Eisenhardt and Lyman (1990) observed that substantial technological innovation lengthens development times and reduces the speed with which first solutions reach the marketplace. The authors argued that highly innovative solutions require nascent organizations to spend more time on creating
new information through their R&D activities because of the uncertainty involved in any innovative solution (cf. Nelson & Winter, 1977).

Moreover, literature on new product development is extensive and speed to market is one of the major outcomes studied in this literature. Importantly, this body of research has demonstrated that there can be a tradeoff between the objectives of minimizing time-to-market for a new solution and maximizing its performance (Bayus, 1997; Cohen, Eliashberg, & Ho, 1996; Millson, Raj, & Wilemon, 1992). New entrepreneurial firms already struggle to establish legitimacy (Stinchcombe, 1965), so poor early product/service performance may be detrimental for these firms. As such, the more the offering of a nascent venture relies on novelty in technology, the longer the time needed to introduce a reasonably developed first solution to the markets. Hence, our last hypothesis:

**Hypothesis 3**: The more novel the solution created to address the business opportunity is in terms of technology, the slower the speed of organizational emergence.

In the light of the above theoretical development, the central theoretical claim that we want to test empirically is that when a nascent entrepreneur makes the decision to pursue an opportunity, the initial characteristics of this opportunity –familiarity to entrepreneur, novelty to market, and novelty in technology –become an identifiable, objective reality that will have imprinting effects on the speed to organizational emergence. The methodology we employ to test the hypotheses is introduced next.

**METHODS**

**Sample**

The hypotheses are tested in a sample derived from the Panel Study of Entrepreneurial Dynamics II (PSED II) dataset. The distinctive feature of the PSED II is that it identifies and
surveys nascent entrepreneurs (NEs) in the process of starting new ventures, thereby overcoming potential survivorship and recall biases typical for surveying entrepreneurs already in business (Gartner, Shaver, Carter, & Reynolds, 2004). At the time of the research, data from the initial data collection round of PSED II (A) and four follow-up waves (B-E) with the same NEs - each completed approximately one year apart - were available. Hence, data for our independent variables come from “Wave A” of PSED II data collection, which took place in September 2005 – February 2006, and data for dependent variable comes from up to four years later. The initial screening processes involved telephone interviews of 31,845 individuals, selected using random digit dial sampling procedures, throughout USA. To be identified as a nascent entrepreneur during the screening process, the respondent had to exhibit the following characteristics: (1) they anticipated having some ownership in a new firm; (2) they had to be actively trying to start a new firm in the past 12 months; but there was (3) no positive monthly cash flow covering all expenses and salaries for 6 of past 12 months. Of the NEs satisfying the screening criteria, further selection and volunteering criteria resulted in 1214 nascent entrepreneurs being subsequently interviewed by telephone in Wave A (Response rate 77%). The PSED II database is representative of the US adult population due to relatively high response rates and weights used to correct for differences in selection probabilities and non-response rates from random data collection. Applying these weights for analyses is essential for the generalizability of any studies related to PSED II data set (Reynolds & Curtin, 2004). In the following analyses, the weights are adjusted to reflect the reduction in the number of cases due to missing and not applicable responses; all analyses are run in a dataset where cases with missing data have been removed. The PSED II dataset and related codebooks are publicly available on the consortium’s website.

1 http://www.psed.isr.umich.edu/psed/home
**Dependent variable**

After the initial interviews, NEs in the PSED II sample were followed up at one-year intervals, and their progress was recorded. The PSED II database includes a time stamp (month and year, reported by the NE) for each activity that the NE had completed following business opportunity recognition. Our primary dependent variable captures the length of time elapsed between (1) When the NE first came up with the business idea, and (2) When the same NE achieved two critical milestones of organizational formation: started exchanges (i.e. made the first sale) and acquired external resources (i.e. hired employees or received external financing). These markers of organizational emergence echo prior research (e.g. Katz & Gartner, 1988; Reynolds & Miller, 1992; Tornikoski & Newbert, 2007). If the first sale took place at a different time (different month) than the first resource acquisition (hiring or funding), the time stamp of the activity that took place last was used to calculate the dependent variable. Higher values on the dependent variable mean that more time has elapsed between coming up with the idea and the completion of the critical milestones.

This coding of the primary dependent variable (DV4) resulted in a continuous measurement of time (in months) that elapsed between when the business idea was first conceived and when organizational markers (Sales and Hire or Financing) were achieved. We call this primary dependent variable “Time to emergence” (DV4). In addition, time (in months) from business idea conception to the first sales (DV1), first hiring (DV2), and obtaining first external financing (DV3) are employed as dependent variables in separate models.

**Independent Variables**

*Familiarity to entrepreneur.* This variable captures the alignment between the opportunity domain and the current knowledge base of the NE. As a part of the PSED II
protocol, the respondents were asked: “Did this new business emerge from your current work activity, from previous work activity, from a separate business you now own and manage, from a hobby or recreational pastime, from academic, scientific, or applied research, or was it from an idea you or another member of the start-up team had?” (Item AA9). Respondents were asked to give a single answer to this question (e.g. “from my current work activity”). For the purposes of the current study, we recoded the answers to this question so that higher values on this variable stand for a more immediate connection between the NE’s knowledge base and the business opportunity domain. In our judgment, and echoing previous research (e.g. Shane, 2000), individuals should be most familiar with opportunity domains that overlap with their current work or a business they currently own and manage. Opportunities that are based on previously held jobs are still quite familiar, but not as familiar as those based on currently held jobs because of the time elapsed. Finally, opportunities may be familiar to individuals if they are related to their hobbies (lifestyle entrepreneurs) or research activities (academic entrepreneurship). However, neither hobbies nor research activities require as intense commitments of time and effort as one’s primary employment. Hence, the final coding of the opportunity familiarity variable reflects the increasing alignment between the opportunity domain and the current knowledge base of the NE: (1) opportunity based on a hobby or recreational pastime, academic, scientific, or applied research; (2) opportunity based on previous work; (3) opportunity based on current work activity or a separate business now owns and manages.

Novelty to market. In describing the characteristics of entrepreneurial opportunities in general, researchers have emphasized the inherent novelty of these opportunities (Ardichvili, Cardozo, & Ray, 2003; Eckhardt & Shane, 2003; Shane & Venkataraman, 2000). The novelty of a recognized business opportunity manifests itself in the solution created to address the very
opportunity. Market novelty is operationalized as a continuous variable based on the NEs’ answers to the following two questions in the first interview (Wave A): “Will all, some, or none of your potential customers consider this product or service new and unfamiliar?” (variable AS1) and “Right now, are there many, few, or no other businesses offering the same products or services to your potential customers?” (variable AS2). The values of the opportunity novelty variable vary between 2 and 6, 2 standing for an opportunity that none of the customers will consider novel and for which there are many competitors, and 6 representing an opportunity that is considered novel by all potential customers and for which there are currently “no other businesses offering the same products or services to potential customers”.

Novelty in technology. This is a dummy variable (0/1) based on NE’s answer to the following question: “Were the technologies or procedures required for this product or service generally available more than five years ago?”. An affirmative answer to this question is coded as a zero, a negative answer is coded as one.

Control Variables
A number of alternative explanations may account for the hypothesized relationships. In the empirical models we control for the effects of NE’s gender, age, level of education, racial background (hispanic, black, white), and previous start-ups (a dummy variable with a value of “1” if the NE has previous startup experience, otherwise “0”). Since larger and more active startup teams may progress faster in the startup process, we also control for the startup team size.

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2 We coded answers to the two questions as follows, and then summed up the two numbers for the final “Novelty to market” variable:
“Will all, some, or none of your potential customers consider this product or service new and unfamiliar?” All=3; Some=2; None=1.
“Right now, are there many, few, or no other businesses offering the same products or services to your potential customers?” No other businesses=3; Few other businesses=2; Many other businesses=1.
(if 10 or larger, recoded as 10), number of supporters\(^3\) (natural logarithm), and effort (hours) invested in the startup by the team (natural logarithm)\(^4\).

As far as the characteristics of the startup business itself are concerned, we control for the nature of the venture: High technology ventures may take a long time to launch, so we include a dummy for high tech ventures. Also, if the nature of the business changes during the start-up process, it may take longer to establish. When first interviewed, the NEs were asked to describe the nature of their business activity. In the follow-up waves, the NEs were asked whether the original description of the business activity was still accurate or not; a dummy variable is included in the models to control for changes to the nature of the business activity over waves B-E.

At the same time, if the NE is starting a venture for his / her current employer progress may be particularly fast, so we include a dummy that receives value “1” if the respondent answered affirmatively to the following question: “You are, alone or with others, currently trying to start a new business or a new venture for your employer, an effort that is part of your normal work. Does this apply to you?” Fast progress in the startup process may also be attributable to NE’s preference for business size; we include a dummy for those who want their businesses to be as large as possible\(^5\).

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\(^3\) Supporters include people, who will not have an ownership share in the new business, but who have provided significant support, advice, or guidance on a regular basis to the (new) business, or have made a distinctive contribution to the founding of the new business through planning, development, financial resources, materials, training, or business services.

\(^4\) When first interviewed in the PSED II effort, the nascent entrepreneurs were asked “How many hours in total have you devoted to this (new) business?” For each additional team member (up to four additional team members, i.e. owners), the nascent entrepreneurs also answered the following question: “How many hours in total has [NAME] devoted to this (new) business?” To calculate the effort variable, we summed up the hours reported as answers to these questions (questions AH14_1-AH14_5 in the PSED II protocol).

\(^5\) This dummy is coded as “1” for those who answered “I want this (new) business to be as large as possible” to the following question: “Which of the following two statements best describes your preference for the future size of this (new) business: I want this (new) business to be as large as possible, or I want a size I can manage myself or with a few key employees?”
Finally, general industry dummies were created to control for a startup effort in a service industry (restaurants, consumer services, health services, finance, insurance, and real estate firms, business consulting services), in retail (retail stores), and in manufacturing. The table in the Appendix 2 summarizes the variables used in the study.

As illustrated in Appendix 2, the number of cases available for analysis drops drastically from the original 1214 when it comes to our dependent variables. This is mostly due to the fact that a large proportion of nascent entrepreneurs originally interviewed at Wave A never achieve the organizational markers we base our dependent variables on (Reynolds, 2007). Instead, they exit the business gestation process, or linger in the process without making progress in achieving critical organizational markers such as first sales. Also, many nascent entrepreneurs create new organizations without ever looking for external funding and with no intentions to hire others. As demonstrated in Appendix 2, while 60 per cent of nascent entrepreneurs achieve first sale within the four-year follow-up period, less than twenty per cent achieve the organizational markers of first hiring or external funding within this same period.

**Analytic methods**

In order to test our hypotheses, we analyzed the data using weighted hierarchical ordinary least squares (OLS) regression. We tested for the main assumptions for using OLS regression, namely normality of the variables, homoscedasticity, and independence of the independent variables (VIF values). All VIF values were comfortably low (below 1.3), indicating no problems with multicollinearity. Correlations between variables are presented in the Appendix 1.
RESULTS

Table 1 presents the OLS regression results of our hypothesis tests, and also lists the final (no missing values) sample sizes for each model.

Models 1a and 1b in Table 1 examine speed to organizational emergence, that is, how long it took the nascent entrepreneur to start exchanges (sales) and to acquire external resources (either employees or financing). As can be seen in Table 1, the F-statistic for the control model (model 1a) is not significant. In addition, the low adjusted R-squared value of 3% suggests that the control model does not explain significant variance in the dependent variable. The significant F-statistic and change in F-statistic, as well as the substantially higher adjusted R-squared value for the full model (model 1b) provide strong evidence supporting our conceptual model. Specifically, these statistics suggest that the full model is a good fit to the data, that the addition of the independent variables produces a model that fits the data significantly better than the control model, and that the full model explains significant variance in the dependent variable (12%), taking into account the phenomenon under investigation.
Table 1: Results of regression models.

| Model                          | DV4: Time to emergence (n=207) | DV1: Time to exchange: Sale (n = 387) | DV2: Time to external resource: Hiring (n=146) | DV3: Time to external resource: Financing (n=139) |
|-------------------------------|--------------------------------|--------------------------------------|-----------------------------------------------|-----------------------------------------------|
|                               | 1a                             | 1b                                   | 2a                                            | 2b                                            |
| Gender (ref. 1=female)        | -.09                           | -.10                                 | -.09†                                         | -.14                                          |
| Age                           | .00                            | -.07                                 | .04                                           | .14                                           |
| Education                     | .00                            | .07                                  | .02                                           | .02                                           |
| Race: Hispanic                | .08                            | .03                                  | -.04                                          | .10                                           |
| Race: Black                   | .07                            | -.03                                 | .00                                           | .20†                                          |
| Startup team size (ln)        | -.14                           | -.16                                 | -.12                                          | .09                                           |
| Number of supporters (ln)     | -.03                           | -.04                                 | -.01                                          | -.02                                          |
| High technology venture       | .01                            | .04                                  | .18***                                        | .03                                           |
| New business for employer     | .08                            | .08                                  | .05                                           | .08                                           |
| Nature of start-up changed    | .08                            | .06                                  | .10*                                          | .04                                           |
| Previous start-ups            | -.06                           | -.10                                 | -.06                                          | -.14                                          |
| Preferred business size (large) | -.05                           | -.05                                 | -.00                                          | -.15                                          |
| Effort by team (hours invested, LN) | .12                           | .11                                  | .03                                           | .11                                           |
| Industry: Service             | .05                            | .01                                  | -.04                                          | -.14                                          |
| Industry: Manufacturing       | -.03                           | -.01                                 | -.06                                          | -.14                                          |
| Industry: Retail              | .00                            | -.06                                 | -.01                                          | -.17†                                         |
| Familiarity to Entrepreneur   |                               | - .31**                              | - .09†                                        | - .30**                                       |
| Novelty to Market             |                               | .11                                 | -.01                                          | .21*                                          |
| Novelty in Technology         | - .15*                         | .00                                  | -.36***                                       | -.10                                          |
| R-square                      | .11                            | .21                                  | .08                                           | .16                                           |
| Adjusted R-square             | .03                            | .12                                  | .04                                           | .05                                           |
| Model change                  | ns                             | ***                                  | * ns                                          | ns                                           |
| F-value                       | 1.3                            | 2.5**                                | 1.9*                                          | 1.5                                           |

*p<.10, *p<.05, **p<.01, ***p<.001. Weighted data.
The full model (model 1b) shows the results of our hypotheses concerning the main effects of the three opportunity characteristics on the speed to organizational emergence (hypotheses 1, 2, and 3). As can be seen, the parameter estimate for Familiarity to entrepreneur is negative and significant as predicted. Thus, we conclude support for hypothesis 1. The parameter estimate for Novelty to market, however, is insignificant. Thus, we conclude no support for hypothesis 2. Finally, the parameter estimate for Novelty in technology is significant, however, negative in direction, which is contrary to our prediction. Thus, we conclude no support for hypothesis 3, but the data suggest that Novelty in technology speeds up the progress to organizational emergence instead.

Furthermore, our empirical models also show that the three initial opportunity characteristics exercise different imprinting effects on the speed to individual emergence factors (see models 2b, 3b, and 4b). That is, the imprinting effects of initial opportunity characteristics vary significantly between a timely first hire, first sales, and acquisition of external financing. More specifically, when “time to first sale” is the dependent variable (model 2b), the model r-squared value remains low, and the model does not fare well in explaining variance in the dependent variable. Yet all three independent variables provide significant contributions to model 3b explaining variance in the dependent variable of “time to first hiring”. Further, model 4b demonstrates that Familiarity to entrepreneur leads to faster securing of external funding while Novelty to market slows down this process.

DISCUSSION
Given the novelty of the relationships investigated in this study, coupled with the empirical support for some of our hypotheses, we believe our findings can shed new light on the understanding of imprinting forces for timely organization creation.

Echoing Johnson (2007), this study profiles imprinting in new organizations as an agent-driven process. Our approach conforms to those, which consider that the decisions made by nascent entrepreneurs at the formative stage of an organization have effects that imprint the organization and impact its performance (cf. Bamford et al., 1999). Our empirical observations provide evidence that the characteristics of emerging ventures at the intersection of pursued opportunities and individual entrepreneurs have an impact on the time it takes to establish a new organization. Our effort should remind researchers of the importance of considering the effects of the entrepreneurial opportunity itself (cf. Davidsson & Gordon, 2012), rather than just entrepreneur’s effort and behaviors, on the process of organizational emergence. Indeed, while previous research in entrepreneurship offers empirical support for the argument that entrepreneurs’ actions influence start-up success and new firm performance (Delmar & Shane, 2004; Dimov, 2010; Tornikoski & Newbert, 2007; Tornikoski & Puhakka, 2009), this research often loses sight of the fact that entrepreneurial opportunities themselves are unique and influence the emergence process. We encourage scholars to pursue this avenue by conceptualizing the emergence of new organizations not only around entrepreneurial behavior, but also around environmental and organizational conditions at the time when the foundations of future organizations are decided upon by enterprising individuals.

Organizational emergence is a multidimensional construct. It is an intentional process on behalf of the key agents, and it culminates in the new organization’s acquisition of key resources (hiring employees, receiving external financing) and its engagement in exchanges (making the
first sales) (Katz & Gartner, 1988; Reynolds & Miller, 1992). In predicting the time to these
different new organization markers, our models fare better in estimating the time to resource
acquisition rather than the time to first sale. This may be a reflection of the fact that resource
assembly is typically required before the first sale can occur (Brush et al., 2008), and our data
only span a four-year period. Especially those new firms that engage in extensive research and
development for their products or services may take even longer to achieve sales. Also,
achieving first sale does not always mean that the firm will have a continuous flow of sales
revenue from that point on. The startup process does not typically progress in a linear manner,
and a first sale can simply mean a modest purchase by a friend or a relative. Hence, timing of the
first sale is likely to be a “noisy” data point, and consequently harder to predict. Assembling
financial and physical resources, however, is a more “involved” activity than achieving first sale.
In hiring a person or in accepting external funding the nascent entrepreneur commits to a
relationship – often a long-term relationship - with an external resource holder. Our models
explain more variance in the time it takes to hire someone for a new firm than in time to first sale
or in time to receiving external funding. This suggests that the opportunity characteristics in
focus here are important predictors of this fundamental type of resource acquisition by
entrepreneurs.

This study answers to the call of Busenitz and his colleagues (2003) to better understand
why some entrepreneurs are able to act more quickly than others in the venture creation process:
by choosing to pursue opportunities which are close to their own areas of expertise and which are
characterized by technological novelty. Indeed, it is interesting to note that the most consistent
empirical findings from our study concern the role of opportunity familiarity, that is, how well
aligned the nascent entrepreneur’s current knowledge base is with the business opportunity they
have identified. Throughout our empirical models intimate familiarity with the opportunity domain shows a potential to speed up organizational emergence. As such, it is important to conceptualize opportunities not only as having some objective characteristics, which are independent from any individual intervention, but also take into account the “individual-opportunity nexus” (e.g. Venkataraman, 1997): Successful, and in our case timely, exploitation of entrepreneurial opportunities is linked to the relationship nascent entrepreneurs have with the opportunities they choose to exploit. This relationship is characterized by the overlap between a nascent entrepreneur’s knowledge base and the opportunity domain. As a consequence, the imprinting effects of opportunities on speed to organizational emergence are contingent upon entrepreneurs’ knowledge.

While previous research has demonstrated that substantial technological innovation lengthens development times and reduces the speed with which first solutions reach the marketplace (e.g. Griffin, 1997; Meyer & Utterback, 1995; Schoonhoven, et al., 1990), we found evidence to contradict the results of these previous scholarly inquiries. We observed that novelty in technology not only accelerates the speed to first hiring but that it actually accelerates the whole process of organizational emergence. While our theoretical rationale was based on the fact that technological development requires more time and resources to complete the start-up process (Reynolds & Curtin, 2011), other forces might be more important to force rapid development for technologically oriented projects. Indeed, since the window of opportunity for technological innovations is constantly shrinking, speed becomes essential in technological projects (Abell, 1978; Markman, et al., 2005). Those nascent entrepreneurs exploiting opportunities based on technological innovations might be forced to adopt rapid exploitation strategies in the face of depreciation of technological novelty, and therefore drive their emerging
organizations into operational businesses in timely fashion. It is worth focusing on this aspect in future studies: whether the novelty in technology indeed fosters entrepreneurial individuals to adopt speedy exploitation strategies, therefore contradicting the notion that the development of new technology delays the time to market.

Previous research has suggested that market novelty can have a significant and negative relationship with a new venture’s chances of survival (Shepherd et al., 2000; Shepherd & Shanley, 1998). Building on this previous conceptual research, we provide empirical evidence that market novelty, while not influencing directly the speed to organizational emergence, slows down the speed at which a new venture is able to build its resource base (i.e. acquiring financing, hiring employees). Even though market novelty has potential to slow down the building of the resource based for a new organization, it is worth remembering that those who succeed in their efforts may benefit from market novelty in the long run. Uncontested markets can provide significant early mover advantages for new ventures that can gain a loyal customer base early on. By preempting scarce assets in strategic factor markets and increasing buyers’ switching costs, market pioneers are likely to benefit from advantageous positions in resource space and creation of entry barriers (Lieberman & Montgomery, 1988; Suarez & Lanzolla, 2007). However, empirical tests of these relationships among new ventures are scarce, and we encourage further research on the topic.

CONCLUSIONS

In an attempt to explain why some new organizations are established faster than others we adopted a perspective according to which a timely organizational emergence can be understood and predicted by viewing it as conditioned by the initial decisions of nascent entrepreneurs regarding the opportunities they pursue. Using a large dataset of individuals who are in the process of building their ventures, and who have been followed up on an annual basis
as they go through this process, we have found empirical evidence to conclude that initial opportunity characteristics exercise imprinting effects on the time it takes to create new organizations. More specifically, a technologically advanced business opportunity that is close to the knowledge domain of the nascent entrepreneur is likely to speed up the organizational emergence process. Furthermore, interesting nuances emerged when we investigated the speed of achieving individual emergence factors (i.e. first sales, first hire, external financing). While none of the three opportunity characteristics seem to imprint the speed to making first sales, they all imprint the speed to first hiring. With regard to acquiring outside financing, two opportunity characteristics (i.e. familiarity to entrepreneur and novelty to market) imprint this process.

**Implications for practice**

The results of this study have several implications for practitioners. In today’s dynamic markets, where new offerings can sometimes be rendered obsolete within months of introduction, the time it takes to establish a business is a critical issue facing nascent entrepreneurs. Based on our results, aspiring entrepreneurs would be well advised to focus on opportunities in industries where they currently work, on opportunities that provide a specific technological edge, and opportunities that do not require a creation of totally new markets.

Entrepreneurs starting up businesses in the same industry where they currently work are likely to face high opportunity costs; the leap to entrepreneurship from an employer in the same industry should motivate them to build the new organization swiftly in order to start making money. Further, aspiring entrepreneurs should take advantage of the fact that current employment in the same industry is likely to allow them access to important industry networks and resources (Agarwal, Echambadi, Franco, & Sarkar, 2004), leading to faster hiring and securing of external funding. In terms of cognitive capabilities, aspiring entrepreneurs should
also acknowledge that previous knowledge of the opportunity domain is important for their pursuit of an opportunity (Baron, 1998; Baron & Ensley, 2006; Shane, 2000). Beyond its previously found effects on opportunity recognition (Shane, 2000), up-to-date knowledge of industry and markets leads to faster decision-making and execution by nascent entrepreneurs at the opportunity exploitation stage, speeding up the gestation process as demonstrated by our empirical data. It is also beneficial for aspiring entrepreneurs to know that their cutting edge knowledge of the industry and markets is also viewed favorably by resource holders such as investors and potential employees, leading to faster securing of external funding and human resources.

Furthermore, our study has interesting insights for those nascent entrepreneurs who do not have to achieve all the three emergence factors in their quest to exploit opportunities in timely fashion. Since all three opportunity characteristics seem to imprint the speed to first hiring, nascent entrepreneurs should pay attention to each opportunity characteristic if they are dependent on hiring external people. In addition, because familiarity to entrepreneur and novelty to market imprint the speed to acquiring outside financing, nascent entrepreneurs should consider these aspects when approaching external financial parties. As such, potential employees and funders are likely to be risk averse and shy away from committing their resources to an emerging venture characterized by high levels of market novelty (i.e. a venture committed to introducing products or services unlike those currently in the market). When markets are novel they are also hard to understand and research, which may turn away early employees and funders looking for signs of positive early market feedback. In such a case, nascent entrepreneurs are advised to spend time on educating key stakeholders (employees, funders) before early hiring and funding milestones can be achieved.
Limitations and directions for future research

While we believe that the results presented herein add to our understanding of the role nascent entrepreneurs’ initial founding decisions play in the timely creation of new organizations, we acknowledge that the present research is not entirely beyond reproach.

The data available to us (PSED II) presents some limitations that should be taken into account when evaluating these findings. In order to investigate variation in the time it takes to achieve certain milestones in the start-up process we had to rely on data from those cases that actually reported having achieved these milestones during the follow-up period. Since the PSED data reflects average startup efforts in the population it contains a large amount of data from nascent entrepreneurs who set out to be self-employed without ever looking for external funding and with no intentions to hire others (Reynolds, 2007); less than twenty per cent of nascent entrepreneurs achieve the milestones of first hiring or external funding within the four-year follow-up. Because of this feature of the dataset, as well as the overall attrition, the sample sizes available for our empirical models were limited (See Table 1 for n of cases in each model).

Regarding the operationalization of Novelty of technology we used a simple dummy variable. We acknowledge that this operationalization is not optimal; technological novelty is far more nuanced than a simple yes / no answer. Unfortunately our empirical data is limited to what was available in the PSED II data set. As such, we advise readers to accept our results guardedly, and, if possible, replicate them with alternative operationalizations.

Also, our results are not representative of those nascent entrepreneurs that do not achieve our selected milestones within the four-year follow up. We realize that failure to achieve the milestones may be due to nascent entrepreneur’s choosing (i.e. wanting to be self-employed and
not looking for external funding) or his/her lack of success in achieving the milestones despite trying. However, this issue is beyond the scope of our study, and our findings simply reflect variation among those who achieve the selected milestones as reported. Notwithstanding these limitations with PSED, it is arguably the best large-scale data on nascent entrepreneurs that we have (e.g. Newbert & Tornikoski, 2013).

Our theorizing regarding the characteristics of opportunities was inspired by earlier works (i.e. Shepherd et al., 2000). By adopting a similar approach we restricted our investigation to three characteristics of entrepreneurial opportunities. As a result of our choice to investigate the effects of only three variables on the speed to organizational emergence, our models explained a relatively small share of the total variance. While we acknowledge the presence of other characteristics of opportunities, and other possible variables coming from other theoretical approaches, we believe this study provides an important early step in efforts to explain the time it takes to establish new organizations. We encourage others to continue on this research path to identify other important imprinting forces.

In sum, we believe that our findings add to what we, as a scholarly community, know about the organizational emergence process, and hope that both academics and practitioners may benefit from them. The opportunity-individual nexus is a particularly important for the entrepreneurial process, yet it has been largely ignored in the empirical literature. By investigating the imprinting role of initial opportunity characteristics, our study is the first one to provide empirical evidence about their influence on the speed to organizational emergence. Ultimately, we hope to have added richness to the ongoing discussion among academics and practitioners alike regarding the importance of opportunities in the entrepreneurial context.
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### Appendix 1: Unweighted correlations. ** p<.01; *p<.05

| Variable                                      | n   | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |
|-----------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Time to exchange: Sale                     | 733 | .1  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2. Time to external resource: Hiring          | 233 | .68**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3. Time to external resource: Financing       | 215 | .70**| .71**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4. Time to emergence                          | 325 | .85**| .86**| .89**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 5. Familiarity to entrepreneur                | 874 | -.07| -.26**| -.31**| -.31**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6. Novelty to market                          | 1197| .09* | .08 | .23**| .15**| -.12**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 7. Novelty in technology                      | 1201| .10**| -.02| .06 | .07 | -.04 | .26**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 8. Gender                                     | 1214| -.08*| -.11| -.04| -.09 | -.06 | -.04 | -.06*| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 9. Age                                        | 1202| .09* | .06 | .04 | .03 | .07 | .04 | -.01 | .02 | 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 10. Education                                 | 1212| .09* | .07 | .05 | .08 | .09**| .02 | .05 | .05 | .24**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 11. Race: Hispanic                            | 1208| -.00| .09 | .09 | .08 | -.07 | .06 | -.02 | -.03 | -10**| -.08**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 12. Race: Black                               | 1171| .11**| .14*| .14*| .13* | -.05 | .10**| .06* | .02 | -.16**| -.05 | -.01 | 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 13. Race: White                               | 1196| -.12**| -.11| -.17*| -.18**| .07* | -.09**| -.06 | .00 | .19**| .11**| -.26**| -.74**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 14. Startup team size                         | 1214| .03 | -.13| -.14*| -.11*| .08* | .04 | .04 | -.06*| .01 | .08**| -.01 | -.03 | .02 | 1   |     |     |     |     |     |     |     |     |     |     |     |
| 15. Number of supporters                      | 1179| -.00| -.03| .09 | -.03 | .00 | -.03 | .01 | -.10**| -.01 | .01 | .03 | -.05 | -.09**| 1   |     |     |     |     |     |     |     |     |     |     |     |     |
| 16. High tech venture                         | 1212| .06 | -.01| .06 | .03 | .01 | .14**| .28**| -.09**| -.01 | .01 | -.03 | .04 | -.05 | .03 | .03 | 1   |     |     |     |     |     |     |     |     |
| 17. New business for employer                 | 1202| .03 | .03 | .09 | .03 | .05 | .04 | .00 | -.10**| -.08**| -.07* | .02 | .10**| -.11**| .02 | .01 | .03 | 1   |     |     |     |     |     |     |     |
| 18. Nature of start-up changed                | 1099| .12**| .09 | .10 | .13* | -.03 | .01 | .00 | .01 | .09**| .06* | -.00 | -.02 | .02 | -.03 | .00 | -.03 | -.02 | 1   |     |     |     |     |     |     |
| 19. Previous start-ups                        | 1213| .02 | -.06| .06 | .02 | .06 | .09**| .05 | -.04 | .29**| .18**| -.05 | -.07* | .05 | .06* | .05 | -.01 | -.08**| .01 | 1   |     |     |     |     |     |
| 20. Preferred business size                   | 1206| -.00| -.16*| .01 | -.06 | .02 | .13**| .05 | -.05 | -.10**| .02 | .05 | .12**| -.08**| .10**| .04 | .11**| .07* | .02 | .04 | 1   |     |     |     |     |
| 21. Effort by team (hours invested)           | 1113| .14**| .14*| .04 | .10 | -.02 | -.05 | .03 | -.07* | .04 | .09**| -.05 | -.05 | .06* | .15**| .10**| .05 | .04 | .01 | .03 | .02 | 1   |     |     |     |
| 22. Industry: Service                         | 1212| -.00| -.01| .00 | .03 | .00 | -.00 | .07* | .01 | .09**| -.02 | .06 | -.01 | -.03 | .03 | .03 | -.00 | -.05 | -.04 | .01 | -.06 | 1   |     |     |
| 23. Industry: Manuf.                          | 1212| .00 | -.07| .06 | .01 | -.04 | .09**| -.01 | -.04 | .11**| .02 | -.01 | -.10**| .07* | .05 | -.06 | .03 | -.04 | .05 | .11**| -.01 | .08* | -.30**| 1   |     |     |
| 24. Industry: Retail                          | 1212| -.03| -.12| .02 | .00 | -.11**| .06**| .00 | .10**| -.05 | -.04 | .02 | -.01 | -.02 | -.03 | .00 | -.06* | -.04 | .01 | -.01 | .02 | -.02 | -.48**| -.09**| 1   |     |     |

38
### Appendix 2: Variable means and standard deviations (unweighted).

| Construct                  | Variable                                      | Type       | Missing % (n=1214) | Transformation | Mean  | S.D.  | Relevant PSED II variables |
|----------------------------|-----------------------------------------------|------------|--------------------|----------------|-------|-------|----------------------------|
| Organizational emergence   | Time to exchange: Sale                        | Continuous | 40%                | ln             | .12   | 1.38  | AA8a, AA8b, AE14a/b - EE14a/b |
|                            | Time to external resource: Hiring            | Continuous | 81%                | ln             | .41   | 1.25  | AA8a, AA8b, AE8a/b - EE8a/b  |
|                            | Time to external resource: Financing         | Continuous | 82%                | ln             | .41   | 1.26  | AA8a, AA8b, AE4a/b - EE4a/b  |
|                            | Time to emergence                            | Continuous | 73%                | ln             | .44   | 1.26  | Based on three variables listed above |
| Opportunity familiarity    | Familiarity to entrepreneur                  | Ordinal    | 28%                | --             | 1.83  | .80   | AA9 |
| Opportunity novelty: Market| Novelty to market                            | Continuous | 1%                 | --             | 3.51  | 1.17  | AS1, AS2 |
| Opportunity novelty: Technology | Novelty in technology                     | Dummy      | 1%                 | --             | .22   | .42   | AS4 |
| Controls                   | Gender (ref. 1=female)                       | Dummy      | 0%                 | --             | .37   | .48   | AH1_1 |
|                            | Age                                           | Continuous | 1%                 | --             | 43.6  | 12.9  | AH2_1 |
|                            | Education                                     | Continuous | 0%                 | --             | 5.53  | 2.13  | AH6_1 |
|                            | Race: Hispanic                                | Dummy      | 0%                 | --             | .05   | .22   | AH3_1 |
|                            | Race: Black                                   | Dummy      | 4%                 | --             | .14   | .35   | AH4b_1 |
|                            | Race: White                                   | Dummy      | 1%                 | --             | .77   | .42   | AH4a_1 |
|                            | Startup team size                             | Continuous | 0%                 | ln             | .42   | .50   | AG2 |
|                            | Number of supporters                          | Continuous | 3%                 | ln             | -.40  | 1.60  | AG13+AG18 |
|                            | High technology venture                       | Dummy      | 0%                 | --             | .24   | .43   | AS6 |
|                            | New business for employer                     | Dummy      | 1%                 | --             | .31   | .46   | QFF1b |
|                            | Nature of start-up changed                    | Dummy      | 9%                 | --             | .20   | .47   | BA12-EA12 |
|                            | Previous start-ups                            | Dummy      | 0%                 | --             | .45   | .50   | AH12_1 |
|                            | Preferred business size (large)               | Dummy      | 1%                 | --             | .20   | .40   | AT1 |
|                            | Effort by team (hours invested)               | Continuous | 8%                 | ln             | 6.15  | 1.78  | AH14_1- AH14_5 |
|                            | Industry: Service                             | Dummy      | 0%                 | --             | .61   | .49   | ABI |
|                            | Industry: Manufacturing                       | Dummy      | 0%                 | --             | .06   | .23   | ABI |
|                            | Industry: Retail                              | Dummy      | 0%                 | --             | .13   | .34   | ABI |