

ORGANIZING ACTIVITIES AND FOUNDING PROCESSES OF NEW VENTURES

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ABSTRACT

PHILLIP H. KIM: Organizing Activities and Founding Processes of New Ventures
(Under the direction of Howard Aldrich)

In this dissertation, I examine three aspects of organizational emergence: composition of founders' support networks, acquisition of external organizational knowledge, and a multi-dimensional approach to identifying emergent organizations. I draw on organizational, social capital, human capital, and social exchange theories to develop my hypotheses. Based on a random sample of nascent entrepreneurs in the United States, I found that founders rely heavily on their strong ties to solicit support; use their specific human capital to guide their acquisition of external knowledge; and follow unique founding processes that differ across industrial groups.

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CHAPTER 1: INTRODUCTION

A significant proportion of working adults in the United States are likely to start new business during their working careers. Every year, approximately four to six percent of the labor force engages in activities to start new businesses (Reynolds and White 1997). Over their lifetimes, nearly 40 percent of the working population have some type of entrepreneurial experience (Aldrich and Ruef 2006). Forty-six percent of adults come from families where the heads of households started their own businesses and 58 percent of adults are interested in starting their own business some day (Steinmetz and Wright 1989). In spite of their aspirations to start successful businesses, most entrepreneurs encounter difficulties in their founding attempts.

In his seminal essay, Stinchcombe (1965) outlined two conditions associated with the failure of new organizations. He argued that new firms face *liabilities of newness* due to poorly established inter-organizational networks and difficulties in developing their organizational infrastructure. New firms are faced with challenges of expanding their networks beyond a close circle of kinship ties. To establish their organizational infrastructure, new firms are limited to their founders' personal knowledge or must find ways to acquire the necessary expertise. As a result of these conditions, founders in new firms encounter a higher rate of failure than more established firms.

Stinchcombe (1965) built his argument based on the assumption that new firms have been created and already exist. In my dissertation, I examine whether Stinchcombe's (1965)

argument also applies to the emergence of new firms. I define emergence as the period during which founders take active steps to transform their business concepts into viable new organizations. I explore how the conditions for the *liabilities of newness* affect founders as they organize their new businesses. Specifically, I investigate whether the two liabilities that Stinchcombe (1965) outlined – poorly developed networks and lack of organizational knowledge – apply to founders in the following two research questions:

1. How do founders form their support networks from which to solicit assistance, advice, and other forms of backing during the start-up process?
2. How do founders acquire organizational knowledge to supplement what they already know through their prior training and experiences?

Organizations scholars who rely on Stinchcombe's theoretical foundations have usually adopted his assumption of new firm existence in their empirical work (e.g., Carroll and Hannan 2000). Scholars in this tradition consider the creation of new firms as discrete events and focus on survival rates throughout the entire lifecycle of populations. Rather than viewing firm foundings as discrete events, I propose treating firm creation as a process of emergence. From this perspective, I focus on a multi-dimensional approach to identify emerging organizations. As a third research question, I explore how founders' organizing milestones reflect properties in emerging organizations.

Researchers who study new firm creation as an emergent process face three major empirical challenges. First, to minimize the impact of survivor bias, researchers will need to employ a sampling strategy that identifies founders and their emerging firms early in their formative process. By employing this strategy, researchers can track founders who establish successful firms along with those that fail. Second, to assess how founders' characteristics

influence their ability to start new ventures, researchers should collect adequate background measures of founders once they and their ventures have been identified. Third, to analyze firm creation as an emergent process, researchers will require information on the new ventures and their founders over time. A longitudinal research design enables researchers to determine whether critical events in the emergence process influences new firm establishment. Researchers can also assess how changes in founders' characteristics and their environment play a role in different stages of the start-up process. To address these three empirical challenges, researchers must employ a longitudinal research design that captures both individual and firm-level characteristics of founders and their emerging firms.

[INSERT TABLE 1.1 ABOUT HERE]

In previous research, scholars have relied primarily on individual-level data sources to examine how individuals transition into entrepreneurship. In Table 1.1, I review four types of individual-level data sources in the United States to highlight their strengths and weaknesses. In the first category, researchers have analyzed panel data such as the National Longitudinal Survey of Young Men, National Longitudinal Survey of Labor Market Experience, and Panel Study of Income Dynamics (e.g., Evans and Jovanovic 1989; Fairlie 1999). Taking advantage of their longitudinal design, these researchers have tracked individuals over significant portions of their careers to understand what factors promote their transitions into entrepreneurship. However, these samples are limited to cohort-related restrictions in gender, age, and race of the respondents. For example, Evans and Leighton's (1989) study using National Longitudinal Survey of Young Men was restricted to a cohort of white men between the ages of 14 and 24 in 1966.

Researchers have also relied on cross-sectional datasets. For example, researchers have used Internal Revenue Service tax records and U.S. Census Current Population Surveys to explore the impact of inheritances and earnings potential on transitions to entrepreneurship (Devine 1994; Fairlie and Meyer 1996; Holtz-Eakin, Joulfaian, and Rosen 1994). However, researchers using these government-sponsored databases are limited by the lack of demographic information on entrepreneurs and encounter high non-response rates in these data sources (Devine 1995). Other researchers have used the General Social Survey (GSS), which contains considerable demographics and other background information (Butler and Herring 1991; Hout and Rosen 2000).

Scholars have also relied on individual-level information within data sources based on firm-level sampling strategies. For example, Bates (1997) used small business datasets, such as the Characteristics of Business Owners (sponsored by the United States Census) to explore the impact of founders' financial and human capital on their transitions to entrepreneurship. These large datasets provide researchers information across multiple industries. However, due to their sampling design, analyses performed with these data are biased towards existing businesses. Without information on failed business, these datasets are more appropriate for understanding the nature of established business rather than analyzing how firms emerge.

Although the studies in Table 1.1 provide some insights into how founders' backgrounds affect their entry into entrepreneurship, researchers using individual-level data are limited in their ability to explore the processes associated with the emergence of new businesses. With individual-level data, firm establishment is often treated as a single, dichotomous outcome. For example, by using annual employment status information,

researchers can identify spells of entrepreneurship. During these spells, researchers assume that founders have established new firms when they report self-employment (and have abandoned their businesses when not self-employed). By assuming entrepreneurial entry as a dichotomous outcome, researchers cannot investigate the steps founders undertook during the process of starting the new business.

In my dissertation, I analyze the Panel Study of Entrepreneurial Dynamics (PSED), a dataset designed to address the challenges associated with examining founders and the emergence of their new ventures. The PSED was designed to identify individuals from a random sample of adults in the United States who reported that they were in the early stages of starting new businesses. In order to select these individuals, referred to as *nascent entrepreneurs*, the PSED used a multi-stage sampling approach to create a sample of 830 nascent entrepreneurs to represent the four to six percent of the US adult population that start new businesses annually (Reynolds and White 1997). The PSED contains information on both founders and the businesses they started. Based on a longitudinal survey design, these data were collected in four waves between 1998 and 2003. Additional methodological details about the survey design are provided in Gartner et al. (2004b).

The PSED provides opportunities to overcome many of the limitations that I have highlighted in Table 1.1. First, by specifically identifying nascent entrepreneurs and tracking their progress over time, the PSED minimizes survivor biases associated with datasets that are restricted to businesses that are more advanced in their development. To ensure this distinction, the PSED relies on a multi-part definition to qualify individuals as nascent entrepreneurs. Second, by interviewing nascent entrepreneurs, the PSED contains comprehensive information on founders' backgrounds and the nature of the businesses they

started. The PSED also over-sampled women and minorities to enhance the quality of the data for these respective groups.

In addition to collecting respondents' background information, the PSED also asks respondents to provide information on other collaborators who have assisted in the development of their new businesses. This unique feature of the PSED allows researchers to explore how and to what extent founders work cooperatively with others in building new organizations. The PSED contains information on two categories of collaborators: owners (team members who have equity in the planned venture) and helpers (individuals who provide advice, services, or other forms of support). In addition to their background information, the PSED asks respondents to describe the nature of their relationships with these collaborators. Given its longitudinal design, the PSED captures changes in ownership and helpers over the successive waves of data collection. These ego-network data enable researchers to bridge together individual-level explanations of entrepreneurial entry and firm creation within the context of their local social networks.

In developing my arguments of founders' social networks, I assume founders face three constraints in developing their social networks (Kim and Aldrich 2005). First, founders tend to associate with others that share similar characteristics. Due to their preference towards homophily, founders will likely lack significant diversity in their networks (Blau 1977). Second, founders are guided by social boundaries that channel their relationships. Due to their family relations, involvement in religious and ethnic communities, and participation in other organized aspects of their social lives, founders will be less likely to pursue relationships that cuts across these boundaries (McPherson, Popielarz, and Drobnic 1992). Third, as humans with finite capacities, founders will settle for less than optimal choices.

Faced with bounded rationality, founders may aspire to, but will unlikely build and maintain support networks, such as one designed by a network analyst, that maximizes their full potential (March and Simon 1958). Based on these three assumptions, I develop my argument that contrasts a more strategically-oriented perspective in which founders take steps to build and benefit from favorable network configurations. I use founders' social network information from the PSED in two ways. First, I utilize the relationship information between founders and their helpers to examine how founders form their support networks. Second, I investigate the types of contributions made by the collaborators to assess how founders secure entrepreneurial knowledge.

Another important feature of the PSED design was to ask respondents to describe their business ventures in significant detail. Respondents reported progress on their start-ups by providing information on various start-up activities, such as completing a business plan, generating revenues, and developing the product/service. Respondents also provided timing information if these start-up activities were completed. I relied on this section of the PSED to examine what types of processes new firms followed as they emerged into established organizational entities. By having both individual and firm-level data in the PSED, I was able to explore how founders' characteristics, both individually and their collaborators, impacted the progress they made with their new ventures.

The dissertation is organized into three substantive chapters. Each of these chapters follows a stand alone, article-style format. Within each chapter, I propose a specific set of hypotheses, describe methodologies, and discuss results. In Chapter 2 (Too Close for Comfort), I explore the characteristics of founders' support networks. Using social capital and social exchange theories, I explain why founders are more likely to work closely with

their strong ties and only selectively with weak and indirect ties. In Chapter 3 (Rounding out the Team), I investigate how founders acquire external organizational knowledge. I use human capital theory to argue that founders' human capital guides their acquisition of general and specific knowledge. I also draw on social capital theory to describe how founders acquire knowledge through relationships developed in their previous training experiences. In Chapter 4 (Open for Business), I propose a multi-dimensional, process-based approach to identifying emerging organizations. I treat organizational emergence as a latent variable with three dimensions: goal orientation, boundedness, and inter-organizational exchange. I conclude with a final chapter that summarizes my primary findings, discusses limitations of the study, and outline extensions for future research.

CHAPTER 2: TOO CLOSE FOR COMFORT - STRONG TIES IN SUPPORT NETWORKS OF NEW VENTURES

INTRODUCTION

Founders must overcome considerable obstacles to ensure their new organizations' survival. Faced with *liabilities of newness*, founders need to deal with their nascent firms' resource constraints, lack of legitimacy, and competitive threats (Aldrich and Ruef 2006; Carroll and Hannan 2000; Stinchcombe 1965). To overcome these hurdles, founders can solicit support during early stages of new ventures from their networks of relationships (Reynolds and White 1997). Without resources to hire expert consultants or talented employees, founders may turn to their support networks to find cost-effective solutions to address their short-term needs, such as external advisors who can provide technical advice, make introductions to key individuals, and facilitate access to financial and physical resources (Hite and Hesterly 2001). In this chapter, I explore how and under what conditions founders form their support networks and whether their support sustains their start-up efforts.

Based on social capital theory, I argue that founders can develop their support networks in two ways. They can call upon their close ties to form dense networks of overlapping relationships. In these networks, social closure allows efficient transmission of information among actors and establishes mechanisms to promote trust and enforcement of social norms (Coleman 1988). Alternatively, founders may act strategically to identify individuals with whom few relationships would overlap in their support networks. With more

distant ties, these individuals enable founders to develop networks with greater range (Burt 1992). Founders can access new information and resources through these network brokers, who act as bridges to other dense local networks (Granovetter 1973).

Given the potential benefits of both approaches, founders might prefer to build a portfolio of relationships that combines both close and distant ties (Baker 1990; Reagans and Zuckerman 2001). However, despite these intentions, founder will likely be constrained by the types of relationships in which they are embedded. In explaining his liability of newness argument, Stinchcombe (1965) reasoned that founders in new organizations are vulnerable to the inefficiencies of relying on close friends and family and the risks of depending on untested relationships with strangers. If founders rely on their direct ties, they enjoy reciprocity and other benefits of network closure. But due to overlapping relationships, a direct tie strategy limits the development of relationships with greater network reach (Renzulli, Aldrich, and Moody 2000). If strangers are pursued and successfully recruited, founders still need to weigh their contributions with the risks of opportunism and other uncertainties from parties with whom no prior relationships exist (Aldrich 2006; Williamson 1981).

Confronted with these limitations, do founders favor one approach over another to build their support networks? Drawing on social exchange theory, I argue that founders will prefer to work more closely with their established ties (Blau 1964; Ekeh 1974; Lévi-Strauss 1969). With mutual trust and understanding in place, founders have the ability to solicit various types of support from their direct ties without being compelled to reciprocate immediately. In contrast, founders who recruit more distant ties do not have established working relationships in place. The two parties will need to negotiate prior to their

collaboration in order to define the context of their relationship. Due to upfront investment costs, founders may be more cautious when pursuing these new relationships.

In the following sections, I describe how founders benefit from their support networks. Based on social capital and social exchange theories, I then develop a set of testable hypotheses for how founders develop their support networks. I test these hypotheses using the Panel Study of Entrepreneurial Dynamics (PSED), a nationally representative random sample of nascent entrepreneurs who are actively working to start new businesses. I find evidence that confirms founders' preference for working with established ties in their support networks. However, founders who rely heavily on direct ties are more likely to abandon their start-up efforts.

THE ROLE OF SUPPORT NETWORKS

Founders form external support networks for several reasons. Typically operating with limited resources, they look to their external support network, especially in smaller ventures, to supplement their own expertise. Founders may draw on their support networks in the following three ways.

First, they may seek business or technical advice from experts to provide organizational knowledge related to operations and strategic planning in their nascent firms (Aldrich and Ruef 2006). By relying on their advisors' expertise, founders can efficiently resolve issues that may require a significant investment of their own time and resources. Founders with little or no previous start-up experience may need assistance with day-to-day operations, such as keeping accurate financial records, meeting legal obligations, or fulfilling customer needs. Experienced founders may seek more specific expertise they personally lack, such as guidance on entering new product markets. Founders can utilize their external

advisors to scan their business environment for competitive action and availability of underexploited resources (Useem 1984). In this function, advisors positioned in non-redundant areas of a network can receive and transmit this type of information to founders (Burt 1992). Advisors with high network prestige will be more likely to receive information from individuals with whom they maintain direct and indirect ties. For example, advisors active in a local Chamber of Commerce can recommend how proposed local ordinances will affect planned new ventures within its jurisdiction.

Second, founders' support networks can provide important introductions to potential investors, customers, or other stakeholders to new organizations. Through these introductions, founders may meet experts, future employees, or other entrepreneurs to discuss business matter informally (Davis, Renzulli, and Aldrich 2006). In particular, prominent individuals in founders' support networks can heighten awareness of and lend credibility to new ventures through well-placed endorsements that enable new firms to overcome any doubts about their legitimacy (Podolny 2001; Stinchcombe 1965). Well-connected supporters who occupy central network positions provide greater impact to their endorsements (Wasserman and Faust 1994). Upon endorsement, potential exchange partners, such as suppliers, customers, and financiers may increase their willingness to work with founders and their new ventures (Shane and Cable 2002).

Finally, founders can receive mentoring and emotional support. Experienced mentors can coach entrepreneurs to avoid certain mistakes, especially those with little start-up experience. In a 2005 nationally representative survey sponsored by the OPEN Small Business Network of 627 business owners/managers of fewer than 100 employees, approximately one-half of the owners reported using mentors for general business decisions

or ideas to grow their businesses (AMEX 2005). In a study of female entrepreneurs, Moore and Buttner (1997) reported that respondents cited emotional support as being the most important role of their professional networks.

FORMING SUPPORT NETWORKS

In the following sections, I explain how founders form their support networks. I introduce three hypotheses regarding support networks: their size, the role of strong and weak ties, and whether their configurations sustain start-up efforts.

Support Network Size

As founding teams increase in size, the number of possible support relationships could increase as a function of the number of core team members. This assumption is based on the role of weak ties – the enlarged pool of potential supporters increases bridging opportunities for founders beyond their local network of strong ties (Granovetter 1973). However, I offer three reasons why support networks may not grow in proportion to founding team size. First, founding teams tend to form around homophilous strong ties (Ruef, Aldrich, and Carter 2003). Limitations on time, energy, and geographic propinquity complicate developing and sustaining numerous strong tie relationships (Blau 1977). In these situations, founders' strong tie relationships are more likely to overlap extensively and share similar backgrounds and experiences. As a result, the ability to marshal assistance from a wider range of potential advisors decreases (Burt 1992; Lin 2001).

Second, founders may attempt to recruit other team members with varied backgrounds to complement their existing skills. If they can successfully attract and work together with qualified individuals, founders can delay calling on their support networks during the early stages of development. For example, founders who lack experience in managing growth in

new ventures may recruit seasoned managers in anticipation of this phase of venture development (Boeker and Karichalil 2002). During the dot.com era of the 1990s, ambitious college and graduate students who experienced initial success with their fledgling internet companies realized their need for experienced executives to head day to day operations and lead additional fundraising activities.

Third, relationships among founders and between founders and their support networks differ based on the level of investment in their new ventures. By devoting significant time, energy, and financial resources, owners aim to develop *asset specificity* within their start-up team by assembling complementary and relevant skills and experiences (Williamson 1981). Founders expect their teammates to resolve business matters by looking internally for additional assistance. Compared to external supporters, founders have more interest in their new ventures' success, given their greater level of investment (Williamson 1981). For these reasons, I expect:

Hypothesis 1: As founding teams increase in size and diversity, support network size will decrease.

The Role of Strong Ties

To fully reap the benefits of their support networks, founders may aspire to have a balanced set of seasoned mentors, prominent advisors, and other specialists in their support networks. Guided by their experience, some founders may anticipate their needs and attempt to recruit qualified people into their networks. However, this strategy requires founders to have the foresight into how their start-up efforts will evolve (Aldrich and Ruef 2006). Without clairvoyance, most founders are unlikely to predict a priori how and when they will turn to their support networks. Thus, when needs arise, founders will first call on individuals

with whom they have strong ties within their current network of relationships, rather than seek out unknown experts prior to launching their ventures (Larson 1992; Podolny 2001; Xu and Ruef 2007).

Founders are likely to rely more heavily on their strong ties due to established norms between the two actors. In these relationships, both actors have invested considerable time and energy into developing a deep mutual understanding for one another (Granovetter 1973). These frequent and substantive interactions enable both actors to develop an awareness of each other's abilities and preferences. Built on trust, strong ties enjoy a higher level of reciprocity than weak ties. For example, Actor A may respond to a call for assistance from Actor B, without consideration of how or when Actor B will compensate for Actor A's assistance. Social exchange theorists refer to these transactions as reciprocated exchanges (Blau 1964). Given their level of mutual understanding, strong tie relationships operate with norms of reciprocity that allow parties to grant assistance without consideration of benefits to be received (Molm 2003). For these reasons, individuals look to a core set of strong ties to request material and social support (Hurlbert, Haines, and Beggs 2000; Kadushin 2002; Renzulli and Aldrich 2005).

For founders, the benefits from working with their strong ties are several. Within their local network of strong ties, founders may avoid significant upfront direct costs for assistance and draw on a "line of credit" from their strong tie support networks as a form of entrepreneurial bricolage (Baker and Nelson 2005). Due to frequent contact, founders are likely to have ongoing conversations with strong ties about their new ventures. As a result, founders can rely on earlier interactions to avoid repeating details or providing extensive explanations and ease the transfer of complex information (Hansen 1999). Founders may feel

more at ease picking up the phone and asking advice of close confidants who are more patient in entertaining questions and solicitations for assistance and respond in a timely manner (Uzzi 1996).

Working with direct ties may create a more suitable environment for mentoring or emotional support. Having opportunities to discuss challenges and receive encouragement from confidants can boost morale and energize founders in their work. Founders may have provided similar assistance in the past to their strong ties and as a result, may be inclined to provide an opportunity for them to reciprocate (Larson 1992).

Social exchange theorists place dyadic reciprocal exchange transactions within a broader category of generalized exchanges (Blau 1964; Ekeh 1974; Lévi-Strauss 1969). Generalized (or indirect) exchanges are not confined to dyadic relationships and involve more than two actors. For example, Actor A receives support from Actor B, but does not expect to reciprocate directly. Assisting a disabled motorist and reviewing professional journal articles are examples of generalized exchanges, where any compensation from these actions come indirectly through continued participation in the exchange system (Yamagishi and Cook 1993). By participating in a generalized exchange system, founders can receive support from other members without immediate or direct reciprocation.

In particular, family-based exchange systems provide founders a setting in which reciprocal exchange relationships can flourish. For example, older family members often lend advice to their younger relatives without any expectations of receiving direct compensation from them. Founders may have a previous history of assisting other family members in generous ways. Within the context of family relations, founders are likely to expect and receive trustworthy advice (Kadushin 2002; McPherson, Smith-Lovin, and Cook

2001). Founders can receive frequent and informal support from other family members (Hurlbert et al. 2000). Family members in particular serve as an important source of resource mobilization for entrepreneurs, especially from those with relevant previous experiences (Aldrich and Cliff 2003). For these reasons, I expect:

Hypothesis 2: Founders are more likely to solicit support from family members than other types of direct ties.

Although there are benefits to working with strong ties, founders face several limitations if they exclusively follow this approach. First, founders will likely receive redundant information and resources (Carley 1991). For example, as interactions continue and intensify between founders and their support network, any unique knowledge known by supporters will flow between actors and be shared by both parties. Founders will share similar network features as they develop relationships with individuals introduced to them by their strong ties (Granovetter 1973). Over time, both founder and individuals in the support networks will exhibit redundant features, reducing the support networks' ability to contribute new and unique information that founders cannot access by themselves.

Second, the principle of homophily suggests that founders may limit themselves to working with individuals with similar backgrounds (Blau 1977). Due to their common locations in socio-demographic space, founders who work primarily with strong ties are less likely to acquire new knowledge from individuals with varied backgrounds. Third, networks of strong ties between alters, in addition to those between ego and alters, lead to a decline in network efficiency (Burt 1992). Founders with inefficient support networks lack network range because individuals know each other and may not be in position to access more distant

resources and information. For example, family based founding teams who work closely with other family members are more likely to have inefficient networks.

Therefore, founders may encounter situations when their strong ties are not equipped to provide the support they need. Under these circumstances, founders will turn to their weak and indirect ties during early stages of their start-up efforts. By accessing their weak and indirect ties, founders may uncover new information and resources (Granovetter 1973). However, ease of access to support depends on two factors: the configuration of founders' networks and willingness to invest in developing new relationships.

Most individuals are embedded in dense, local networks (Watts 2003). Because weak ties provide links to other local networks, founders with multiple weak ties are best positioned to uncover new information and resources. Under these circumstances, weak ties serve as bridges that allow founders to develop new relationships in other local networks (Burt 1992; Granovetter 1973). However, for founders who are not embedded in sparse networks, pursuing these new relationships can be quite taxing due to the time and energy investment required to sustain them. Growing networks of weak ties require founders to overcome inclinations to recruit individuals into their networks only from their own sociodemographic niche (McPherson 1983). Second, founders should have an ability to scan their personal networks, beyond their immediate direct ties, to identify additional, well positioned advisors. Individuals will fall short of identifying optimal configurations due to their bounded rationality (March and Simon 1958).

Founders who pursue weak and indirect ties for support in their networks also are more likely to enter into negotiated exchanges. Negotiated exchanges are one form of a restricted exchange that occur exclusively between two parties and involve direct

reciprocation from one actor to another (Blau 1964; Ekeh 1974; Molm 2003). Because established norms that direct their relationships do not exist, founders may be required by other actors to agree to guidelines that oversee their support. Both actors will settle on the terms of their exchange through some form of bargaining process. Negotiated exchanges call for founders to invest more significantly into preparing and maintaining these relationships than with their strong ties. Based on factors such as quality and availability, founders will screen potential individuals from whom to solicit support. Often, these transactions will require founders to compensate for services and advice they receive. Given limited resources, founders will want to limit the number of negotiated exchange agreements. Unless creative methods to delay compensation are negotiated, founders will call on them sparingly until their start-up efforts progress in development.

Under ideal circumstances, negotiated exchanges may evolve into reciprocal exchanges, as both parties develop trust and construct norms that guide their interactions (Blau 1964; Ruef 2003). Experimental studies have shown that reciprocal exchanges generate greater levels of trust and commitment than negotiated exchanges (e.g., Molm, Takahashi, and Peterson 2000). Founders who intend to cultivate stronger ties out of their negotiated exchange relationships may encounter difficulties in moving away from agreements that guide their interactions. In spite of these limitations, a major benefit to founders comes from the extra planning involved to form and maintain effective negotiated exchange relationships. With limited resources on hand, founders will take extra steps to ensure that any investment made into these transactions will result in productive exchange relationships. For example, when working with attorneys who charge by the minute, founders will prepare their questions in advance in order to make efficient use of their consultations. This extra planning can also

protect founders from negotiations that exploit their limited resources (Pfeffer and Salancik 1978; Williamson 1981).

Serving as bridging relationships, weak tie supporters provide an additional benefit of linking founders to other local networks (Reagans and Zuckerman 2001; Watts 2003). For example, individuals who span multiple local networks can provide introductions to potential customers or funding sources through bridging relationships to founders. Therefore, in spite of the added start-up costs, founders who identify and develop successful relationships will access valuable support that can ultimately benefit sustaining their new ventures.

Previous studies have shown positive benefits that result from maintaining a hybrid support network, anchored by a core set of strong ties and complemented by additional weak ties (Baker 1990; Reagans and Zuckerman 2001). Founders will likely draw heavily from their core set of strong ties and selectively solicit support from other relationships within their network. Collectively, this should have a positive effect on start-up efforts during their initial stages. For these reasons, I expect:

Hypothesis 3: Founders who work primary with strong ties in the support network are more likely to abandon their start-up efforts.

DATA AND METHODS

I analyzed data from the Panel Study of Entrepreneurial Dynamics (PSED), a nationally representative sample of nascent entrepreneurs in the United States actively starting new businesses. To form the sample, a two-stage design was used. In the first stage, 59,575 adults, aged 18 years and older, residing within the contiguous 48 states of the United States, were selected between July, 1998 and January, 2000 using random digit dialing (RDD) methodology. These individuals completed a screening interview which contained

four qualifying questions. Individuals qualified as nascent entrepreneurs if they expected to be majority owners of new businesses they had been actively trying to start within the last 12 months. Owners reporting firms with positive cash flow for at least three months or majority institutional ownership did not qualify. This initial screening interview resulted in a pool of 1,164 eligible individuals who could be located. From this pool, individuals were randomly drawn and invited to participate in the full study. In this second stage, 830 individuals, which included women and minority over-samples, completed the full survey, for a response rate of 71 percent. Respondents reported information on their new ventures, team members and members of their external support networks. The University of Michigan's Institute for Social Research oversaw the final data collection efforts. A complete description of the study's background, sampling methodology, and response rates can be found in Gartner et al. (2004b).

Due to various reasons, I dropped 23 cases from the final sample. Fourteen cases of the 23 cases were dropped due to lack of majority ownership by nascent entrepreneur(s) (seven cases), maturity of the new business based on three months of positive cash flow (six cases), or missing team data (one case) (Ruef et al. 2003). After reviewing start-up activity information, I dropped an additional nine cases based on four reasons: misinterpretation of questions (two cases), no reported start-up activity (three cases), and start-up too advanced based on timing of accomplished activities (four cases). In my analyses, I used an effective sample of 807 cases.

The nascent entrepreneurs in the sample responded to two name generator questions. The first question asked for names of other individuals who would share in ownership of the new venture. I refer to these individuals as members of the start-up team. The second

question asked for names of people who have been helpful in the start-up process, but not members of the start-up team. I refer to this set of individuals as the external support network. For both name generators, respondents could provide up to five names and for each individual identified, a set of name interpreter questions were asked. Start-up team size was based on the number of owners reported with the name generator question.

For start-up team members only, respondents reported role relations between ego/alter and among each alter. Respondents chose from six categories (spouse/partner; relative/family members; business associates/work colleagues; friends/acquaintances; strangers before joining the team; other type of relationship) to describe each relationship within the start-up team. For the support network, respondents reported role relations between only ego and alter from the following six categories (spouse/partner; relative/family members; business associates/work colleagues; friends/acquaintances; teacher/counselor; other type of relationship). As a result, relationships between alters can be derived only among family members. Fourteen new ventures reported having a non-person team member holding a minority ownership stake (e.g., financial institution, business). For these cases, I excluded the relations between other team members and non-person entities from the measures described below.

I utilized individual case weights calculated by the Institute for Survey Research at the University of Michigan for the PSED. These weights accounted for differences in selection probabilities based on age, education, race, and sex (based on the Current Population Surveys conducted by the U.S. Census) and corrected for differences due to differential non-response rates (Curtin and Reynolds 2004).

Variables

Start-up team variables: In addition to *team size*, I created the following team-related variables. To measure kin relationships, I coded teams with a *spousal/partner pair* with a dichotomous variable and also calculated the *number of non-spousal kin ties* that existed among all members of the start-up teams. Spousal pairs occurred in approximately one-half of all new ventures that started as teams, with an additional 20 percent of teams composed of other non-spousal family members (Ruef et al. 2003).

To develop variables for tie strength, I used measures of sociodemographic distances. I relied on *unification principle* developed by Fararo and Skvoretz (1987), who stated that “The greater the number of dimensions along which associates differ, the greater is the chance that the tie is weak” (1199). Based on this principle, I approximated tie strength by identifying structural similarities of related individuals. Due to the effects of homophily, I assumed that similarly situated individuals are more likely to build relationships and sustain them over time (Burt 2000; McPherson et al. 2001).

Given their effectiveness as indicators of tie strength, I calculated age, gender, and race distance measures among team members (McPherson et al. 2001). For *age heterogeneity*, I calculated the standard deviation among all team members. For *gender diversity*, I created indicator variables for all male, all female, and mixed gender teams (excluding spousal pairs). Single gender teams made up approximately 70 percent of the non-spousal sample. For *racial diversity*, I used a dichotomous indicator to code the eight percent of teams which were heterogeneous. I treated solo ventures as a special case of a start-up team and coded these cases in the following manner: size (one); age heterogeneity (zero); gender diversity (either all male or female); and racial diversity (no).

Support network variables: Respondents reported whether they worked with other people outside the start-up team “who have been particularly helpful to you in getting the business started.” Respondents who reported “yes” provided the number of helpful individuals to their new ventures. I used this information to calculate *support network size*. For the 37 percent of respondents who reported no supporters, I coded their support network size to zero. Respondents also provided gender, race (white, black, Hispanic, other race), age, and relationship information for up to five of their most helpful individuals. Because there was incomplete background information for 39 respondents who reported *having more than five supporters*, I created an indicator variable for their cases. To test for network closure effects due to kin relations, I calculated both the *number of kin and non-kin supporters*. The number of kin and non-kin supporters ranged from zero to five. I also calculated the *total number of kin ties* among all founders and their supporters.

Respondents reported how many *years they have had a relationship with the supporter*, with an average and median length of 11.6 and 8.5 years, respectively. For 81 cases, respondents reported knowing the supporter “all my life” for at least one supporter. I used the following procedure to recode these cases. If the supporter was a relative, I coded either the age of the respondent or supporter (which ever was smaller). If the supporter was a friend, I coded the age of the respondent minus seven years, assuming the childhood friendship started at age seven. If the supporter was a teacher or counselor, I coded the age of the respondent minus 15 years, assuming the relationship started at age 15. If the supporter was a work colleague or business associate, I coded the age of the respondent minus 21 years, assuming the relationship started at age 21. For each respondent, I summed together the *number of times they discussed business matters in the last month* with their supporters. I

took the natural logarithm of the time variable to correct for skewness (average and median number of discussions occurred 26 and 15 times respectively and ranged from 0 to 320 times).

I included five control variables. Because start-up team composition may vary based on the type of business, I created a four category *industrial sector* measure (primary/manufacturing; retail/wholesale; consumer/support services; professional services) based on 1997 NAICS coding scheme. I included two measures of previous work experience, *proportion of start-up team members with start-up experience* and *average years of experience in the industry of the new venture*, which can also contribute to the development of support relationships. I included *organizing time* to account for the length of time founders have been working on their ventures. Respondents reported if and when 25 start-up activities (e.g., purchasing raw materials, writing a business plan, etc.) occurred. I calculated organizing time based on the number of months between their earliest reported activity and time of interview. (See Appendix A for details.) I took the natural logarithm of organizing time to correct for skewness. Finally, I created an indicator variable to distinguish the 13 percent of new ventures *affiliated with an external sponsor* such as a franchisor or multi-level marketing firm. I included this variable to account for founders who gained access to a wider network of resources through their sponsors. In Table 2.1, I present additional descriptive statistics for these and other variables used in my analyses.

[INSERT TABLE 2.1 ABOUT HERE]

[INSERT TABLE 2.2 ABOUT HERE]

ANALYSIS AND RESULTS

To test Hypothesis 1, I estimated the relationship between start-up team characteristics and size of the support network using negative binomial regression techniques (n=776, based on listwise deletion). I used these techniques over Poisson regression models because overdispersion existed. The dispersion parameter (α) was greater than zero and statistically significant for all models. Based on regression diagnostics, I did not observe any indications of collinearity (values of VIF were less than three). In addition to the overall number of supporters, I tested relationships for kin and non-kin supporters separately with network size.

In Table 2.2, I reported results for three separate models, based on (a) total, (b) kin, and (c) non-kin supporters, for each of the five start-up team characteristics (size, age, family tie, gender, and racial diversity) provided at the first interview. Results from these models provide general support for negative relationships between team size and diversity with support network size (Hypothesis 1). In Model 1, age and racial diversity were negatively associated with total support network size. For each standard deviation increase in age, the support network size decreased by three percent (i.e., $100 * (\exp^{-0.03} - 1)$). Mixed race teams decreased support network size by almost 40 percent. However, as the number of kin ties increased in founding teams, the expected number of supporters increased by about 13 percent. In Model 2, for each additional team member, the expected number of kin supporters dropped by 55 percent, but kin ties again had a positive influence on the expected number of kin supporters (by over 40 percent for each additional tie). The positive relationship between non-spousal kin ties and the support network size in Models 1 and 2 suggests that founders look to their extended relations for support during the start-up phase (Aldrich and Cliff 2003).

Contrary to expectations in Hypothesis 1, the expected number of kin supporters doubled for mixed gender teams (i.e., $100 * (\exp^{.72} - 1)$). In Model 3, the expected number of non-kin supporters decreased by one-half for teams with spousal pairs. Relationships may overlap for spousal pairs and restrict the pool of potential supporters.

Hypotheses 2 and 3 focused on the relative reliance by founders on strong and weak ties within their support networks. I tested these hypotheses using negative binomial regression models, with total number of business discussions during the last month as my dependent variable. The dispersion parameter (α) was greater than zero and statistically significant for all models. I restricted this analysis to teams having at least one supporter at the first interview (n=487, based on listwise deletion). Eight percent of teams reported more than five supporters. Because I had complete information on the length or type of relationship for the five most important supporters, I included an indicator for teams with large supporter networks in the following models. Based on regression diagnostics, I did not observe any indications of collinearity (values of VIF were less than two).

[INSERT TABLE 2.3 ABOUT HERE]

In Table 2.3, I reported results supporting Hypothesis 2. Founders were more likely to have frequent discussions about business matters with their core direct ties, as measured by length of relationships. For every year founders have known their supporters (Model 1), the expected number of discussions increased by two percent. In terms of working specifically with other family members, I found the expected number of discussions increased by almost 65 percent for each additional supporter who was a family member (Model 2).

I also found support for selective use of founders' non-family ties. Founders were very unlikely to work with indirect ties. Based on descriptive analyses, only one percent of

founders reported working with strangers in their support network. Founders were likely to receive some support from other existing ties, but to a lesser extent compared to their family ties. The expected number of business discussions dropped from almost 65 percent for family supporters to 15 percent for each additional non-kin supporter (Model 2). In all three models, teams with spousal pairs were less likely to discuss business matters with supporters. Among the control variables, teams with more start-up experience and working with an external sponsor increased the likelihood of having frequent discussions with their supporters. Teams having more than five supporters also had a positive relationship, implying that founders engaged more regularly with their supporters in large networks (Model 3).

In my final analysis, I assessed whether support networks contribute to sustaining the founding process. I analyzed the impact of network size on the rate at which founders abandoned the start-up process. Respondents became at-risk for quitting their new ventures after the first qualified start-up activity occurred. (Refer to Appendix A for details.) The outcome event was whether respondents quit their start-up efforts. A total of 316 respondents reported quitting their new ventures. I updated support network and team covariate information at the following time points: start-up team formation dates, interview dates (up to four), and quit date (if applicable). For the control variables and kinship variables among team and support networks, I used their initial values and did not update them over time.

I assumed all start-ups started as solo ventures initially. Team size was updated at the time of start-up team formation. For 101 cases, respondents reported start-up team formation as their first start-up activity. For these cases, I assigned team size reported at the first interview for the initial spell. For 152 cases, respondents reported forming a start-up team prior to the initial interview, but reported being a solo owner at the first interview. Because

the respondent did not provide any information on their former teammates, I assumed team size to be one since the beginning of their start-up activities. For teams that experienced ownership changes after the first interview, I assumed they occurred shortly after the last recorded interview, because respondents did not disclose when any changes in ownership occurred. For example, if the respondent reported two owners at the second interview, I assigned the value of two for team size between the first and second interview spell.

[INSERT TABLE 2.4 ABOUT HERE]

In Table 2.4, I reported results for the piecewise exponential models. The underlying functional form followed a non-monotonic trajectory consistent with the liability of adolescence theory (Brüderl and Schussler 1990; Stinchcombe 1965). To estimate duration dependence, I used a piecewise exponential model with four time segments beginning at 0, 12, 24, and 48 months since first start-up activity. In Model 1, founders with ventures between 24 and 48 months in age quit at almost three times ($e^{5.91-4.87}$) the rate of younger ventures between 0 and 12 months of start-up. After peaking during the 24 to 48 month time segment, the rate of quitting decreased for ventures greater than 48 months.

In Hypothesis 3, I predicted that founders who work closely with their strong ties are more likely to quit. I found support for this hypothesis. Founders who work more closely with family members in their support networks were more likely to abandon their start-up efforts. Greater kin ties on the founding team alone did not have a statistically significant relationship, but greater total kin ties (i.e., among team and support network) did increase the rate of quitting. For each additional kin tie, the expected rate of quitting increased by five percent. Frequency of business discussions with the support network also increased the rate of quitting. The association's small magnitude may be due in part to the positive effect of

selective discussions with weak ties, diluting the negative effect of considerable reliance on family members.

Contrary to expectations in Hypothesis 3, founders who work with their spouses were less likely to abandon their start-up efforts. Additionally, founders with larger support networks were also less likely to abandon their start-up efforts. Larger support networks decreased the rate of quitting by about 12 percent for each additional supporter ($100*(e^{-0.12}-1)$). In larger support networks, founders may increase their likelihood of having weak ties to support their founding efforts.

I ran two sensitivity analyses to check for model robustness. First, I examined whether left-truncation issues in the PSED produced biased results. Following the recommendations of Gartner et al. (2004b), I reran all four models for ventures 24 months or younger in age. As a second test, I used a Cox model and included organizing time (ln) as a control variable (Singer and Willett 2002). In both situations, I found results consistent with the original models. Additionally, these models exhibited good fit, based on plots of the Nelson-Aalen cumulative hazard function against the cumulative Cox-Snell residuals.

DISCUSSION

In this paper, I explore how and under what conditions founders form their support networks and whether their support sustains their start-up efforts. I summarize my results in the following three ways. First, diverse founding teams, in terms of age and race are less likely to look to their support network for assistance. However, teams with a high density of family members are more likely to rely on other family members for support. Second, founders discuss business matters more often with supporters with whom a long-term relationship exists. Founders also engaged in selective discussions with their supporters

beyond their families. Third, although larger support networks benefit founders by reducing the rate of quitting, founders who work primarily with other family members are more likely to quit.

I highlight several features of the PSED study design to describe the context for which these results should be evaluated. Addressing issues related to these design features can also serve as the basis for future research. First, because respondents reported information for each alter and relationships between alters, the PSED collected only one slice of the respondents' cognitive social network (Krackhardt 1987). Respondents did not distinguish whether advisors nominated through the name-interpreter questions were recruited by other team members. Respondents can report some attributes for alters, such as their gender, racial, or family relations, with minimal uncertainty (White and Watkins 2000). However, when requesting more detailed information (such as educational and financial background), ego-based reports will likely result in increased non-response or measurement error. Collecting this type of information would require alters to be interviewed directly.

Second, direct measures of tie strength, such as Granovetter's (1973) four-part definition (amount of time, emotional intensity, mutual confiding, and reciprocity) may yield additional insights. Although I used sociodemographic distance measures as a proxy, direct measures of tie strength can capture additional differences in the relationship context especially among family members (Marsden and Campbell 1984). Third, for multi-person, non-kin based founding teams, information on the support network may be incomplete. Because I relied on information provided by respondents, additional supporters relied upon by other team members may have been omitted by the respondent. Although relying on respondents' reports may underestimate the presence of weak tie supporters, I consider the

impact to be small. I assumed kin-based teams had overlapping networks, which minimized the potential number of additional supporters who were not reported. Approximately twenty percent of multi-person founding teams had at least one non-kin tie.

Fourth, because small teams start new ventures, drawing any inferences from a reduced sample of larger teams may be premature. A study conducted on large founding teams could yield additional insights (e.g., Reagans and Zuckerman 2001). In large founding teams, the potential exists for a much greater range in the strength of relationships among team members and supporters. However, because multi-person teams are rare, any findings would need to be evaluated accordingly. Finally, in this study, I assumed support networks co-evolved with start-up teams. Supporters can play different roles for different stages in the start-up process. For example, by helping to recruit an experienced person as a team member, advisors reduce founders' need for future assistance. Additional information on when founders began their support relationships would allow for analyses to test this assumption.

IMPLICATIONS AND FUTURE DIRECTIONS

I highlight four implications for future research and practice from this study. First, as founders' new organizations establish their legitimacy, their support networks will evolve with time, gaining weaker ties to replace an initial core set of strong ties (Aldrich and Ruef 2006). But in the short term, founders may need to evaluate the overall net benefits of working with close ties. Although trustworthy and supportive, relying on strong tie supporters, such as family members can hamper founders' ability to survive and achieve milestones in organizational formation (Reynolds and Miller 1992).

Second, network studies show empirically that local networks can be linked to other local networks through bridging ties to form a global network (Watts 2003). However,

founders who intend to take steps to bridge to other local networks confront significant barriers. Individuals face pressures of homophily to interact and sustain relationships with individuals unlike themselves (Kim and Aldrich 2005). Founders face bounded rationality, unable to scan beyond their direct ties for complementary partners and supporters (March and Simon 1958). Founders require a significant investment of time and energy to maintain new relationships with diverse backgrounds, given limits in time and energy. They also will need to invest into developing productive negotiated exchanges that are likely to emerge from these bridging relationships.

Third, if founders can assemble an optimal support network of strong and weak ties, the benefits will likely decline over time. Opportunities to access new information and resources due to structural holes are greatest in the short-term when the distribution of information is not at equilibrium (Aldrich 2006). As individuals increase the level of interactions by working together on a new venture, the knowledge shared between the actors will increase (Carley 1991). Over time, the benefits derived from their interactions in terms of non-overlapping knowledge will decrease. Effective relationships will mature as team members and their supporters collaborate, while unproductive relationships will lead to some supporters to part ways with founders. Over time, these two factors will diminish the initial benefits as the density of strong ties increases. Without new relationships entering regularly into a local network of founders and supporters, initially well-endowed ventures (in their access to information) may face a *liability of adolescence* as relationships mature (Brüderl and Schussler 1990). This liability also applies to founding teams that lose members. Unless relationships have been institutionalized within the new ventures, departing members may take with them any potential advisory relationships. Depending on the strength of the

relationships, a triadic relationship among all three parties (founding team, departing owner, and departing owner's supporter) may be difficult to sustain.

Lastly, new ventures must initially rely on existing relationships that founders have with other individuals (Aldrich and Ruef 2006; Hite and Hesterly 2001). Without inter-organizational relationships in place, founding members draw on their experiences and backgrounds to develop and maintain relationships with potential supporters. Collectively, these relationships contribute to form an external network of supporters for a new organization. Over time, if their ventures survive, the founders' initial support networks may evolve into the core of a future inter-organizational exchange network (Brass et al. 2004). For example, a friend who responded to a few legal questions in the preliminary planning stages may eventually be hired as the new firm's legal advisor. Thus, *individual attachments* among start-up team members and advisors may evolve into *structural attachments* (as client/service provider) in time (Seabright, Levinthal, and Fichman 1992). With advisory relationships unlikely to change dramatically over time, initial support network structures become an imprinted feature of new ventures (Stinchcombe 1965). Over reliance by founders on an extended network of supporters may indicate a lack of coherence within the start-up effort and lead to a shift in power to external providers (Pfeffer and Salancik 1978). Therefore, in addition to issues of resource constraints and legitimacy, studies of organizational emergence and survival should account for these support network characteristics.

CHAPTER 3: ROUNDING OUT THE TEAM: HUMAN CAPITAL AND THE ACQUISITION OF ORGANIZATIONAL KNOWLEDGE IN NEW VENTURES

INTRODUCTION

Scholars have argued that founders' human capital plays a critical role in entrepreneurial entry, performance, and survival (Brüderl, Preisendörfer, and Ziegler 1992; Evans and Leighton 1989; Gimeno et al. 1997). Having established this link, scholars have begun to look more closely at how human capital generates favorable entrepreneurial outcomes (e.g., Delmar and Shane Forthcoming). Training and experience matter, but what remains unclear is how human capital enables founders to take specific actions when organizing their new ventures. In this chapter, I explore how founders' human capital enables them to acquire external knowledge to support their organizing efforts.

To establish how prior training and experience influence organizing processes, I adopt the two dimensional classification scheme of general and specific human capital that other scholars have used (Becker 1993). In terms of general human capital, such as education and general work experience, Evans & Leighton (1989) reported a positive association with transitions into entrepreneurship in the United States. Arum & Mueller (2004) provided similar evidence in a collection of cross-national studies of 11 advanced industrialized countries. In terms of specific human capital, scholars have focused on two forms of training: industry and prior entrepreneurial experiences. Bosma, van Praag, Thurik, & de Wit (2004)

showed positive effects of industry experience on performance and survival using a sample of Dutch entrepreneurs registered in 1994 with the Dutch Chamber of Commerce. Evans & Leighton (1989) also argued that prior start-up experience increases the likelihood of entrepreneurial entry. Delmar & Shane (Forthcoming) showed non-linear influences of industry and prior start-up experience on start-up survival and performance. Building on these findings, I explore the influence of founders' human capital on their entrepreneurial decision making, represented by how they seek external knowledge.

In the early stages of firm creation, founders encounter limited resources, competitive pressures, and other constraints that force them to rely principally on their personal knowledge accumulated through prior training and experience (Stinchcombe 1965). Experienced founders can identify limitations in their own portfolio of skills and abilities required to launch their new ventures successfully. By creatively finding ways to enhance their own abilities, founders can lower their risks for failure. Drawing on their own experiences, founders evaluate their options, such as seeking expertise or imitating successful practices to apply to their start-up efforts (Aldrich and Ruef 2006).

In addition to training and skill development, founders accrue social capital through professional networks they develop. Enrolling in formal education programs create opportunities for students to form bonds with other classmates, find mentors, and gain access to their alumni networks. Working on project teams in established organizations enable employees to develop mutual trust and friendships with their colleagues. Professionals involved in a particular industry can form ties with suppliers, customers, regulators, and other stakeholders. Founders can take advantage of their professional relationships, cultivated through training programs and work experience, to call upon for assistance. Nahapiet &

Ghoshal (1998) described how social relationships facilitate the development of knowledge within organizations. Within existing relationships, founders can take advantage of a common cognitive and relationship foundation to support potential collaborations. This approach to securing external knowledge stands in contrast to more strategically-oriented explanations in which founders benefit by forming closer relationships with distant ties in their network or developing new relationships with previously unconnected individuals (Burt 1992). According to this explanation, founders gain novel and timely information by working with strangers due to access outside their local networks. Therefore, in this paper, I also investigate how founders' social capital guides their acquisition of external knowledge.

In the following sections, I develop a theoretical background and a set of testable hypotheses for the role of human and social capital to support founders as they develop their new ventures. I test these hypotheses using the Panel Study of Entrepreneurial Dynamics (PSED), a nationally representative random sample of nascent entrepreneurs who are actively working to start new businesses. After reporting my findings, I conclude with implications for our current theoretical understanding of founders' human capital and propose areas for future research.

THEORETICAL BACKGROUND

Scholars have argued that new ventures started by experienced founders are more likely to grow and survive (Brüderl et al. 1992; Delmar and Shane Forthcoming). To develop this argument, researchers relied on the assumption that prior investments in human capital enable founders to take appropriate actions and make relevant decisions during the organizing process. This assumption is consistent with Coleman's (1988) comparison of the value of physical and human capital: "Just as physical capital is created by changes in

materials to form tools that facilitate production, human capital is created by changes in persons that bring about skills and capabilities that make them able to act in new ways.” (S100). In this study, I make this assumption more explicit by examining how founders access external knowledge using their human capital. I also explore whether founders achieve more favorable start-up outcomes by accumulating external knowledge.

I follow a competence-based framework that directly links human capital to skills and distinguishes between general and specific forms of human capital (Becker 1993; Colombo and Grilli 2005). From this perspective, I assume that individuals equipped with general skills can transfer and apply them to situations beyond the primary settings for which they were initially trained. For example, founders can secure favorable terms from potential suppliers or persuade skeptical customers to consider a new product offering using negotiating skills acquired when previously working in sales environments. Founders equipped with general skills draw from a pool of broad business knowledge to assess business opportunities and execute operational decisions.

In contrast to general skills, specialized training applies more narrowly to a particular setting, such as learning unique routines for an organization. For example, founders can take advantage of their specialized skills by starting a new business in the same industry where their skills were acquired. Sorenson & Audia (2000) described the high geographic concentration of new business activity in the footwear industry. To account for this concentration, they explained that experienced managers would leave their positions in older, established firms to start competing firms nearby. In addition to technical skills, specialized training may also apply to mastering other skills, such as managing employees within a distinctive corporate culture.

Benefits from Human Capital

Founders who intend to start new businesses benefit from their general and specific human capital in three ways: skill development, decision making abilities, and social network formation. First, skill development occurs through declarative memory, such as concepts learned within a classroom setting, or through procedural memory, such as learning routines and replicating existing practices during on the job training (Cohen and Bacdayan 1994; Polanyi 1966). Second, while formal training enables skill development, on the job training provides opportunities for gaining tacit knowledge and other aids to making business decisions. Third, obtaining human capital through educational institutions and established organizations provide founders opportunities to form professional networks. In the following sections, I describe these three benefits from accumulated human capital in greater detail.

Skill development

Through work experience, founders can acquire fundamental skills which are necessary to start new businesses. By working in positions that expose them to technical, managerial, and other functional skills, founders can draw on this knowledge as they launch their new organizations. In addition to honing specific functional skills, founders also benefit from having a broad range of experiences. For example, in larger organizations, managerial trainees work in multiple departments and are exposed to a wide range of operational scenarios. Having breadth of skills, especially in marketing and management can further assist founders in organizing their ventures due to the number of issues that relate to these areas (Roberts 1991; Shane 2003). By developing expertise in certain skills and gaining exposure to others, founders can learn “on the job” and avoid making similar mistakes when starting their own ventures. When this learning occurs while working for someone else,

founders benefit from direct and indirect training costs incurred by their employers. Although scholars tend to consider the cumulative impact of work experience on entrepreneurial activity, Dobrev and Barnett (2005) argued that skills acquired during recent work experiences may have a more pronounced effect based on their study of entrepreneurs who were alumni from an elite MBA program. The impact of recent work experiences is most likely relevant to specialized training. Founders trained in current technologies bring to their new ventures considerable awareness of the latest technical requirements and issues. Founders who are not “current” in their training may face a significant learning curve in order to update their prior experiences.

Founders also acquire skills through formal educational opportunities. While secondary and college-level education provide individuals with opportunities to develop general critical thinking, analytical, and communication skills, founders who complete elective courses and advanced degree programs are likely to obtain more specialized skills. Trade schools allow students to concentrate on a particular craft, while graduate schools enable students to become qualified in a specialized field. Students who complete business courses and degree programs acquire both general and specific business skills. Inexperienced founders can acquire specific business knowledge by attending seminars and workshops specifically designed for individuals who wish to start a business. In contrast, students who enroll in formal business degree programs typically complete a comprehensive curriculum of courses in finance, accounting, marketing, and strategy. Additionally, students in degree programs who specialize in entrepreneurship can learn more specific skills related to the founding process. For example, through these focused programs, students are taught how to

generate pro forma financial statements, write effective business plans, and pitch their concepts to potential investors.

Although practical experience and formal education may emphasize distinct forms of training, Becker (1993) described how two forms of training can also support one another in their outcomes. On the job training can reinforce theoretical concepts taught in the classroom (Polanyi 1966). For example, executing an effective marketing strategy for a new business often requires more than implementing steps learned in a marketing class. Principles acquired from a textbook can be reinforced by designing plans aimed at actual implementation. Work experience can also spur additional classroom training. Graduate business programs are designed for students to build on their previous work experience. As a result, the impact of these skills on new venture success should be viewed as a complementary relationship between founders' education and work experience.

Judgment and decision making

In addition to skill development, founders gain tacit knowledge by working closely with seasoned experts. On the job training provides a setting for founders to learn complicated information that may be difficult to transfer in a classroom setting (Polanyi 1966). Founders may exercise better business judgment for making critical operational decisions during early stages of the start-up process by relying on their tacit knowledge gained through prior experience. By combining tacit knowledge with other general skills, founders can develop cognitive templates from their earlier experiences and use them as frameworks to execute decisions for their new ventures (Walsh 1995). Founders may rely on these cognitive templates more deeply when starting businesses in the same industry or relying on similar functional processes learned during their previous training (Aldrich and

Ruef 2006). Experience in a start-up environment provides founders with first-hand knowledge of executing business decisions in a resource constrained environment (Baker and Nelson 2005). Founders with start-up experience may also have a greater sensitivity towards pacing of start-up activities and understanding potential consequences of every action undertaken. For example, founders may face ongoing decisions regarding whether to complete certain tasks internally or to solicit external assistance. Founders who have started successful businesses may recognize how and when to rely on external assistance to supplement internal expertise. Successful entrepreneurs may also act with more caution, guided by their awareness of effective strategies and likelihood for imitating practices that work (Haunschild and Miner 1997).

Social network formation

As a third benefit from human capital development, founders have opportunities to form their professional networks as students in formal educational programs or employees in established organizations. In these settings, project assignments, committee responsibilities, or other forms of collaborative work enable classmates and co-workers to interact and develop working relationships. As a result of these interactions, founders are likely to maintain their trusted and mutually supportive relationships. Depending on the level of closeness, founders may call upon these associates for trusted advice or expertise without feeling a need to compensate them for their services (Uzzi 1996).

Founders may have also developed mentoring relationships with faculty or supervisors. Similar to working relationships established with colleagues, founders with strong mentoring relationships may continue their interactions with trusted counsellors after graduation or rotating off a project team. Given their particular expertise and prior

experiences, mentoring relationships provide founders another valuable resource for advice and knowledge.

Founders can expand their network by taking advantage of their alumni affiliation. Networking forums, such as alumni clubs, directories, and online networking websites can support founders in search of assistance from fellow alumni. Founders can explore their alumni networks to identify future employees or potential customers. Introductions from network contacts may provide founders access to other restricted networks, such as business roundtables or associations. Founders may turn to faculty members of their alma maters as another source of expertise by requesting their advice informally in conversations or more formally through their participation on advisory boards.

To summarize, founders can benefit from their accumulated human capital in three primary ways: acquiring general and specific skills; gaining tacit knowledge to aid in decision making; and developing professional networks. In the following section, I describe how founders use these characteristics to evaluate the level of organizational knowledge in their nascent firms and their search for external knowledge.

HUMAN CAPITAL AND ACQUISITION OF ORGANIZATIONAL KNOWLEDGE

As a part of the start-up process, founders in new firms begin to develop their organizational infrastructure. Founders rely initially on their accumulated human capital to create new roles and routines unique to their nascent organizations (Stinchcombe 1965). In nascent firms, these roles and routines focus primarily on mobilizing resources, developing initial products and services, and achieving other start-up milestones. Experienced and well-trained founders may respond to these organizing demands more effectively. Founders can utilize their previously acquired skills and elect to work fairly independently, especially

during initial stages of venture development. Founders aware of proven practices can imitate them in their own start-up efforts (Aldrich and Ruef 2006).

Founders with limited experience may turn to external knowledge providers for more specialized assistance. External knowledge providers can help founders launch their businesses in new industries or geographic regions where founders' expertise is limited. Inexperienced founders may acquire information specific to particular industries, such as regulatory requirements, market conditions, and competitive dynamics more efficiently through external providers. Founders may elect to recruit seasoned managers to grow a nascent business upon establishment (Boeker and Karichalil 2002). Founders may align with external knowledge providers formally by recruiting them as team members or forge relationships with experts to provide assistance on a more ad-hoc basis. For these reasons, I expect:

Hypothesis 1: As founders' human capital increases, the likelihood of requesting external knowledge decreases.

Without established roles and standardized routines, new firms face elevated risks of failing (Stinchcombe 1965). As a temporary remedy, he suggested, "New organizations have to get by with generalized skills produced outside the organization, or have to invest in education (including especially the cost of inefficiency until people learn their roles) (148)." Founders can address this issue of insufficient organizational knowledge in four different ways. First, founders may hire qualified individuals as employees. Second, founders may identify specific needs and purchase these services. From a long-term perspective, these first two strategies provide significant advantages to founders. Investments into hiring employees can institutionalize core routines in new firms and develop asset specificity within their organizational infrastructure (Williamson 1981). Hiring consultants or specialists to provide

specific business services allows for greater flexibility in addressing organizational needs. However, founders are unlikely to pursue these strategies in the short-term. These options require founders to devote substantial financial resources that may be unavailable during early stages of starting a new business.

Founders may be more inclined to pursue two alternative options to acquire external knowledge in the short-term that do not require considerable resource investments. First, founders may recruit additional team members with relevant skills and experiences. For their initial investment of time and financial resources, founders can offer future equity to these recruited owners in the new firm without any significant short-term financial outlays. Second, founders may look to their professional network to solicit their assistance as advisors to their start-up efforts. By calling on these individuals, founders may receive assistance without any immediate expectation for financial remuneration.

Founders may encounter situations for which their previous training and accumulated knowledge are insufficient. Under these circumstances, founders still rely on their human capital to guide them as they search for these external knowledge providers. Using their experience, founders can identify what types of assistance to solicit and potential sources to consider. General knowledge may not be as critical to acquire, especially if founders have sufficient general training that allows founders to address basic issues they encounter during day to day operations. However, specific knowledge, such as technical skills or developing a marketing plan may be sought to supplement existing abilities of founders. Founders who are experienced managers may delegate certain tasks in order to focus on achieving central organizing milestones. Founders with start-up experience may understand how and when

external experts can provide additional support for specific start-up tasks. For these reasons, I expect:

Hypothesis 2a: As founders' human capital increases, the likelihood of obtaining general knowledge externally decreases.

Hypothesis 2b: As founders' human capital increases, the likelihood of obtaining specific knowledge externally increases.

Founders with poorly developed social networks are limited in their ability to recruit knowledgeable experts. Stinchcombe (1965:148) explained, "Clearly, the distribution and generality of skills outside the organization, the socially induced capacity to learn new roles (especially without visible role models), and the ease of recruitment of skills to new organizations will affect the degree of disadvantage of organizational innovations." In principle, founders can pursue multiple channels for acquiring external knowledge. However, founders are likely to request assistance initially from individuals with whom relationships exist (Granovetter 1985). By relying on their direct ties, founders can trust their assistance and expect a greater willingness by these knowledge providers to support their founding efforts (Coleman 1988). Over time, if their new ventures progress, founders can move beyond their initial core network of advisors and strategically identify experts with whom no prior relations exist. However, in the short-term, founders are more likely to turn to their professional network, such as colleagues and business associates. By coming from similar professional backgrounds, founders share narratives, codes, and other cognitive dimensions with their colleagues that enable them to work effectively together (Nahapiet and Ghoshal 1998). Founders can feel confident that their professional colleagues will provide assistance in a timely and dependable manner (Uzzi 1996). Founders can benefit from their colleagues' expertise when faced with specific issues that require relevant knowledge in selected

industries or geographic regions (Schoonhoven, Eisenhardt, and Lyman 1990). For these reasons, I expect:

Hypothesis 3: Founders are more likely to turn to their professional colleagues than other individuals to solicit external knowledge.

Scholars have shown that higher levels of human capital among founders increase the likelihood for new venture survival (Brüderl et al. 1992; Delmar and Shane Forthcoming).

One explanation for this relationship centers on how founders effectively assemble knowledge in order to achieve organizing milestones. By marshalling expertise through their professional networks, founders are likely to raise the level of organizational knowledge required to sustain the start-up effort. With assistance from recruited team members and advisors, founders may efficiently identify new financial resources, meet customer needs through their intended products and services, and negotiate favorable terms with their suppliers. For these reasons, I expect:

Hypothesis 4: As organizational knowledge increases, founders are less likely to abandon their start-up efforts.

DATA AND METHODS

I analyzed data from the Panel Study of Entrepreneurial Dynamics (PSED), a nationally representative sample of nascent entrepreneurs in the United States actively starting new businesses. To form the sample, a two-stage design was used. In the first stage, 59,575 adults, aged 18 years and older, residing within the contiguous 48 states of the United States, were selected between July, 1998 and January, 2000 using random digit dialing (RDD) methodology. These individuals completed a screening interview which contained four qualifying questions. Individuals qualified as nascent entrepreneurs if they expected to be majority owners of new businesses they had been actively trying to start within the last 12

months. Owners reporting firms with positive cash flow for at least three months or majority institutional ownership did not qualify. This initial screening interview resulted in a pool of 1,164 eligible individuals who could be located. From this pool, individuals were randomly drawn and invited to participate in the full study. In this second stage, 830 individuals, which included women and minority over-samples, completed the full survey, for a response rate of 71 percent. Respondents reported information on their new ventures, team members and members of their external support networks. The University of Michigan's Institute for Social Research oversaw the final data collection efforts. A complete description of the study's background, sampling methodology, and response rates can be found in Gartner et al. (2004b).

Due to various reasons, I dropped 23 cases from the final sample. Fourteen cases of the 23 cases were dropped due to lack of majority ownership by nascent entrepreneur(s) (seven cases), maturity of the new business based on three months of positive cash flow (six cases), or missing team data (one case) (Ruef et al. 2003). After reviewing start-up activity information, I dropped an additional nine cases based on four reasons: misinterpretation of questions (two cases), no reported start-up activity (three cases), and start-up too advanced based on timing of accomplished activities (four cases). In my analyses, I used an effective sample of 807 cases.

The nascent entrepreneurs in the sample responded to two name generator questions. The first question asked for names of other individuals who would share in ownership of the new venture. I refer to these individuals as members of the start-up team. The second question asked for names of people who have been helpful in the start-up process, but not members of the start-up team. I refer to this set of individuals as the external support network.

For both name generators, respondents could provide up to five names and for each individual identified, a set of name interpreter questions were asked.

I utilized individual case weights calculated by the Institute for Survey Research at the University of Michigan for the PSED. These weights accounted for differences in selection probabilities based on age, education, race, and sex (based on the Current Population Surveys conducted by the U.S. Census) and corrected for differences due to differential non-response rates (Curtin and Reynolds 2004).

Variables

Human capital variables: I assigned two types of human capital variables for each respondent, consistent with previous research (Brüderl et al. 1992; Colombo and Grilli 2005; Schoonhoven et al. 1990). For general human capital, I created three variables. *Education* is a five category variable (up to high school; vocational/technical training; some college; college graduate; and post-college). Years of *general full-time work experience* (net of managerial experience) and *managerial experience* are continuous measures (in years). For specific human capital, I created four variables. *Industry work experience* is a continuous measure (in years). *Previous start-up experience* is a dichotomous variable (1=yes). To assess the effects of *current business ownership*, I developed a four category variable based on the respondent's paid employment status: (1) people who said they were business owners or self-employed with no other jobs; (2) owners or self-employed persons who also worked for an employer for less than 35 hours per week; and (3) owners or self-employed persons who also worked for an employer for more than 35 hours per week. This distinction provides the ability to assess whether respondents rely on additional external knowledge given their level of dedication to the start-up attempt. I also denoted founders who *completed classes or*

workshops on starting a business as a dichotomous variable (1=yes). Education (both formal and business start-up), general and managerial experience, and current business ownership information were available only for the respondent.

Knowledge contribution variables: Respondents provided information on four types of organizational knowledge contributed by each team member and supporter to their start-up effort. I designated *information and advice* and *training in start-up related business skills* as general knowledge contributions and *providing business services* and *having previous start-up experience* as specialized knowledge contributions. I created separate dichotomous variables for each team member to indicate whether a contribution was made (1=yes). I also totaled the number of contributing team members to create a continuous summary variable for each type of knowledge contribution. I repeated this procedure for the set of supporters. For solo start-ups and those without any supporters, I assumed the start-up effort did not receive any external knowledge contributions. Their contributions were coded as zero.

Relationship characteristics variables: I created a set of variables describing the dyadic relationship between the respondent and team member or supporter prior to joining or assisting the start-up effort. For start-up team members only, respondents reported role relations between ego/alter. Respondents chose from five categories (spouse/partner; relative/family members; business associates/work colleagues; friends/acquaintances; strangers before joining the team) to describe each relationship within the start-up team. I combined the first two categories (i.e., family) and created a four category *team relationship* variable. For the support network, respondents reported role relations between ego and alter from the following six categories (spouse/partner; relative/family members; business associates/work colleagues; friends/acquaintances; teacher/counselor; other type of

relationship). I combined the first two (i.e., family) and created a five category *support relationship* variable. Fourteen new ventures reported having a non-person team member holding a minority ownership stake (e.g., financial institution, business). For these cases, I excluded the relations between other team members and non-person entities.

Team size variables: I included *net start-up team size* based on the number of owners (excluding the respondent) and the *support network size* based on the number of supporters reported. Because name generator questions did not capture the full information on contributions for 39 respondents who reported *having more than five supporters*, I created an indicator variable to mark these cases.

Control variables: I included three control variables. To account for differences in knowledge requirements across industries, I created a four category *industrial sector* measure (primary/manufacturing; retail/wholesale; consumer/support services; professional services) based on 1997 NAICS coding scheme. I included *organizing time* to account for the length of time founders have been working on their ventures. Respondents reported if and when 25 start-up activities (e.g., purchasing raw materials, writing a business plan, etc.) occurred. I calculated organizing time based on the number of months between their earliest reported activity and time of interview. (See Appendix A for details.) I took the natural logarithm of organizing time to correct for skewness. Finally, I created an indicator variable to distinguish the 13 percent of new ventures *affiliated with an external sponsor* such as a franchisor or multi-level marketing firm. I included this variable to account for founders who may have access to a wider network of resources through their sponsors.

I provide descriptive statistics for these variables in Table 3.1. A sizeable proportion of founders have some form of previous start-up (43 percent) or current business ownership

(46 percent) experience. Forty-two percent of founders have completed a course on starting a business. On average, start-up teams are relatively small, with founders working in teams of less than two and receiving assistance from two supporters. Approximately 60 percent of the new ventures are in the consumer or professional services sectors.

[INSERT TABLE 3.1 ABOUT HERE]

ANALYSIS AND RESULTS

To test Hypotheses 1, I estimated the relationship between the respondent's human capital variables and the number of additional members of the team and support network recruited to the start-up effort (Table 3.2). Since these are count variables, I used negative binomial regression models to estimate these relationships ($n=792$, based on listwise deletion). Based on regression diagnostics, I did not observe any indications of collinearity (VIF values were less than two).

[INSERT TABLE 3.2 ABOUT HERE]

As predicted in Hypothesis 1, increasing human capital decreased the likelihood of recruiting additional members of the team and support network. Founders with previous and current start-up experience were less likely to recruit additional team members (Model 1). The expected number of additional team members decreased by 16 percent (i.e., $100 * \exp^{-.17}$) for founders with previous start-up experience and by 25 percent for founders who currently own a separate business. Founders with more general full-time and managerial experience were less likely to recruit supporters (Model 2). These negative relationships suggest that founders who had sufficient accumulated experience were less likely to solicit external assistance. However, the influence of experience differed between team and support network recruitment. Specifically, founders with greater specific human capital were less

likely to recruit additional team members, while founders with greater general human capital were less likely to solicit assistance from their support network.

The one exception to this explanation was education. Founders with higher levels of education were more likely to recruit an additional team member (Model 1), but education had no effect on recruiting supporters. Depending on the level of education, the expected number of team members increased by 35 to 62 percent. One possible explanation for these divergent results centers on the relevance of human capital acquired through education about the start-up process. Although they learned basic skills through classroom training, founders may still need to recruit additional team members due to a lack of relevant business training in their curriculum. Unfortunately, respondents did not provide more specific educational background information, such as their majors or completed courses to test this explanation. Alternatively, more highly educated founders may benefit from their larger social networks and have more opportunities for collaborations.

[INSERT TABLE 3.3 ABOUT HERE]

To test Hypotheses 2 and 3, I estimated the relationship between founders' human and social capital and the type of knowledge they acquired. Since the outcome variables were dichotomous, I used logistic regression models (n=379 for team members; n=478 for supporters – based on listwise deletion). In these two sets of models, I restricted the analyses to only team-based start-up attempts and attempts that reported working with at least one external supporter respectively. Because information about contributions from members of the team and support network was nested in start-up attempts, I clustered the analyses by each attempt to account for the non-independence among contributors and used the

Huber/White/Sandwich estimator of variance. In Table 3.3, I present results from these analyses.

In Hypothesis 2a, I predicted that as founders' human capital increases, general knowledge acquisition will decrease. I found partial support for this hypothesis. In terms of general knowledge contributions, founders' general human capital had little impact. For each year of managerial experience, the odds of requesting advice from their team members decreased by three percent (Model 1a). With their accumulated experience, founders may rely on their personal skills and general business acumen rather than actively recruit additional team members primarily for the advice they can contribute. Highly educated founders were also less likely to request external business training.

Specific human capital, however, influenced both team member and support network recruitment for general knowledge. The odds were approximately 50 to 80 percent higher for founders who completed a business start-up course to have a team member or supporter provide advice or training in start-up related business skills (Models 1b, 2a, 2b). Contrary to expectations, founders' industry experience had a negative relationship with having supporters provide information and advice (Model 1b). One explanation for this negative relationship may be attributed to the lack of precision in capturing the type of information and advice offered. Respondents may have reported the extent to which their supporters contributed general information and advice. Experienced founders may have already established considerable understanding of their industry and have little need initially for general advice. Based on these mixed results, I found partial support for Hypothesis 2a.

I found stronger support for Hypothesis 2b. Higher levels of founders' human capital tended to increase the likelihood of specialized knowledge contributions by members of the

team and support network. In terms of general human capital, depending on the level of education, the odds of recruiting both members of the team and support network to provide business services to the start-up effort increased by 1.8 to 2.3 times (Models 3a and 3b). For each year of managerial experience, the odds of recruiting both members of the team and support network who have start-up experience increased by about two to three percent (Models 4a and 4b). This positive relationship may reflect a greater willingness of experienced founders to organize their emerging businesses by delegating to their more experienced team members. Contrary to expectations, higher education produced a negative relationship for founders recruiting a team member with start-up experience.

For specific human capital, the odds of recruiting a team member to contribute business services to the start-up effort increased by three percent for each year of industry experience (Model 3a). Entrepreneurs with significant industry experience have a greater understanding of specific business services to employ during start-up and may seek these skills among potential team members. For founders who owned a business and worked for someone else full-time, the odds increased by almost 70 percent (Model 3a). Having previous start-up experience nearly doubled the odds that founders recruited supporters to contribute business services to the start-up effort (Model 3b). Founders with start-up experience also were more likely to recruit team members (3.5 times as likely) with start-up experience (Model 4a).

I found partial support for Hypothesis 3 where I predicted that founders looked to their business associates and work colleagues for general knowledge contributions. Founders were 3.3 times as likely to have a colleague (compared to strangers) as team member provide

information and advice (Model 1a).¹ Founders were over six times as likely to have a teacher or counselor as an advisor to provide training in start-up business skills (Model 2b).

Contrary to expectations, when recruiting for business services contributions or start-up expertise, business colleagues did not produce a statistically significant relationship for either team members or supporters. Instead, strangers were more likely than family and friends to be recruited for their business services contributions (Ruef et al. 2003). Based on these results, founders sought out highly skilled team members by foregoing their business colleagues in favor of strangers.

In Hypothesis 4, I predicted that as organizational knowledge increased, founders were less likely to abandon their founding attempts. To test this prediction, I estimated the relationship between organizational knowledge and the rate at which founders quit the start-up process. Respondents became at-risk for quitting their new ventures after the first qualified start-up activity occurred. (Refer to Appendix A for details.) The outcome event was whether respondents quit their start-up efforts. A total of 311 respondents reported quitting their new ventures. I updated support network and team covariate information at the following time points: start-up team formation dates, interview dates (up to four), and quit date (if applicable). For the control variables and kinship variables among team and support networks, I used their initial values and did not update them over time.

I assumed all start-ups started as solo ventures initially. Team size was updated at the time of start-up team formation. For 101 cases, respondents reported start-up team formation as their first start-up activity. For these cases, I assigned team size reported at the first interview for the initial spell. For 152 cases, respondents reported forming a start-up team

¹ In Model 1b, due to lack of cases where advisors who contributed to information and were not previously connected to the respondent, I used “friends/acquaintances” as the reference category.

prior to the initial interview, but reported being a solo owner at the first interview. Because the respondent did not provide any information on their former teammates, I assumed team size to be one since the beginning of their start-up activities. For teams that experienced ownership changes after the first interview, I assumed they occurred shortly after the last recorded interview, because respondents did not disclose when any changes in ownership occurred. For example, if the respondent reported two owners at the second interview, I assigned the value of two for team size between the first and second interview spell.

[INSERT TABLE 3.4 ABOUT HERE]

In Table 3.4, I report results for the piecewise exponential models. The underlying functional form follows a non-monotonic trajectory consistent with the liability of adolescence theory (Brüderl and Schussler 1990; Stinchcombe 1965). Ventures between 24 and 48 months in age quit at over four times (i.e., $\exp^{6.21-4.78}$ – based on Model 1) the rate of younger ventures between 0 and 12 months of start-up. After peaking during the 24 to 48 month time segment, the rate of quitting decreased for ventures greater than 48 months.

In these four models, I used continuous summary variables that are based on the number of team member and supporters who contributed to the founding effort. I found general support for Hypothesis 4. In Models 1 and 2, I included the four types of knowledge contributed by members of the team and support network respectively. For each additional team member that contributed information and advice, the hazard rate decreased by 20 percent. In both models, for each additional team member or supporter who provided business services, the hazard rate decreased by about 40 and 20 percent, respectively. In Model 3, when both sets of contribution variables were included jointly, the magnitude of the hazard rates remained fairly similar. In Model 4, I included the founders' human capital

variables. The hazard rate for information and advice contributions increased (to 30 percent) and business services contribution for team members slightly weakened (to 35 percent). The statistical relationship for supporters was no longer significant.

By comparing these results with those reported in Table 3.3, a more nuanced explanation of founders' human capital emerged. Founders appeared to rely on different approaches to acquiring the two forms of external knowledge that reduced the hazard rate. To recruit team members for information and advice, founders primarily relied on their professional network (Model 1a). In contrast, to recruit team members for business services contributions, founders' human capital, rather than their professional relationships, produced significant results (Model 3a). These divergent explanations suggest that founders may need to selectively rely on their existing professional network to acquire external knowledge. Additionally, although founders were more likely to turn to strangers for business training, this particular contribution did not reduce the hazard rate of quitting.

Among founders' human capital variables, only specific human capital reduced the likelihood of abandoning the start-up effort (Model 4). All three current business ownership variables generated statistically significant relationships. Depending on the level of commitment, current business ownership reduced the hazard rate by about 60 to 70 percent. Founders who ran separate businesses benefited from their specialized "on the job" training. Current business ownership also implied a greater degree of success in the founders' prior start-up experiences. Because of its quality and relevance, founders could directly transfer lessons learned from their concurrent business involvement to their new start-up efforts.

In contrast to current business ownership, previous start-up experience generated no statistically significant results. Although founders with previous start-up experience

abandoned at a slower rate, recruiting members of the team and support network with previous start-up experience had no impact. This is consistent with earlier findings (e.g., Schoonhoven et al. 1990). One explanation may stem from the likelihood that the previous start-up experience measure captures mainly failed attempts (Kim, Aldrich, and Keister 2006). Reynolds and White (1997) reported approximately one-half of nascent entrepreneurs abandon their start-up efforts. Facing the liabilities of newness, newly formed organizations still encounter high risks of failure. Because the previous start-up experience measure in PSED did not distinguish between successful and failed attempts, alternative explanations cannot be analyzed more thoroughly. However, the lack of a significant relationship may be due in part to the inability of nascent entrepreneurs to learn sufficiently from their start-up experiences or to apply what they learned to their current start-up effort. Perhaps the previous start-up efforts did not last long enough to generate specific organizational knowledge to transfer.

Alternatively, the quality of the start-up experience measure is unclear. Experience may range from working as an employee for a newly founded firm to having direct day to day operational decision making responsibility as a manager or owner in new ventures. Again, this particular measure in the PSED does not provide this level of distinction. Given Delmar & Shane's (Forthcoming) non-linear finding for start-up experience, current business ownership, rather than prior start-up experience, provides a better indicator of what type of start-up experience has a stronger influence on entrepreneurial survival.

Founders benefited from two other forms of specific human capital. The completion of a business start-up course reduced the hazard rate by almost 30 percent. Industry work

experience also reduced the likelihood of abandoning the start-up effort. For every year of average team industry work experience, the hazard rate decreased by about three percent.

In terms of results for the control variables, the hazard rates for start-ups affiliated with an external sponsor were higher than *de novo* unaffiliated start-ups. Additionally, hazard rates for larger start-ups were also higher. Unless founders recruit and receive relevant organizational knowledge from their teammates, larger start-ups are more likely to fail potentially due to coordination issues among team members. Knowledge specialization allows each team member to fulfill specific roles on start-up teams. Without the specialization, nascent firms cannot develop their organizational infrastructure and overcome their “liability of newness” (Stinchcombe 1965).

DISCUSSION

In this study, I explored how founders’ human capital influences their entrepreneurial decision making in terms of their ability to acquire external knowledge. In summary, founders with higher levels of human capital were less likely to recruit additional team members or solicit advice from experts. However, when external knowledge was sought, founders were guided by their specific human capital. Reliance on business associates and strangers differed on the form of general knowledge solicited. Founders in start-up attempts supported by general knowledge contributions (information and advice) and specialized knowledge (business services) were less likely to abandon their ventures.

I highlight several features of the PSED study design to describe the context for which these results should be evaluated. Addressing issues related to these design features can also serve as the basis for future research. First, because respondents reported information for each alter and relationships between alters, the PSED collected only one slice

of the respondents' cognitive social network (Krackhardt 1987). Respondents did not distinguish whether supporters nominated through the name-interpreter questions were recruited by other team members. Respondents can report some attributes for alters, such as their gender, racial, or family relations, with minimal uncertainty (White and Watkins 2000). However, when requesting more detailed information (such as educational and financial background), ego-based reports will likely result in increased non-response or measurement error. Collecting this type of information would require alters to be interviewed directly.

Second, because the survey design utilized an ego based data collection strategy, I assumed that the respondent (ego) was the primary founder of each new venture. This allowed me to take advantage of the complete human capital information available for each respondent. Without additional information on directionality, I also assumed that ego initiated the recruitment of alters. If human capital information was available for alters, I could assess whether founders sought complementary skills and training backgrounds if human capital effects were consistent in both directions. A complete network study may identify additional insights on how alters perceive their recruitment and knowledge contributions.

Third, additional precise measures of both human capital and organizational knowledge measures could yield deeper insights. In terms of human capital, specific information on educational accomplishments, such as majors and concentrations could help identify whether founders received training in a particular field of study. Measures of success in previous start-up experience may be conveyed through length of spells in prior business ownership, work in start-up environment, or prior business revenues and assets (Carroll and Mosakowski 1987; Dunn and Holtz-Eakin 2000). In terms of knowledge contributions,

distinguishing which types of advice and business services offered by members of the team and support network can further enhance interpretations of how founders' human capital influence their acquisition. For example, by knowing whether founders solicited industry-related or functional advice, influence of prior experience in these areas can be assessed. Timing of when knowledge was sought and received would generate further explanations of how founders recruited external providers.

IMPLICATIONS AND FUTURE DIRECTIONS

In this paper, I use a competency-based framework to explain how founders employ their prior training and experiences to acquire external knowledge. I highlight five contributions and implications to theory and practice. First, human capital theory has emerged as one explanation of how and why investments in particular types of training lead to differential outcomes (Becker 1993). Labor market studies traditionally have examined human capital investment on personal income. For organization and entrepreneurship scholars, human capital theory can be used to develop explanations for entrepreneurial entry and survival (e.g., Gimeno et al. 1997). Are there particular training regimens or trajectories that lead to more favorable entrepreneurial outcomes, due to better decision making and knowledge acquisition capabilities? Based on these analyses, I suggest that founders with varied training and experiences spanning both general and specific knowledge are well positioned to make decisions leading to successful new ventures.

Second, some scholars have argued that having entrepreneurial family background provides a setting for acquiring relevant organizational knowledge. Children can learn business skills from their parents, especially by working for them during their adolescent and young adult years (Aldrich, Renzulli, and Langton 1998; Carroll and Mosakowski 1987).

Dunn & Holtz-Eakin (2000) argued that individuals with parents who are successful entrepreneurs (measured by the period of parental self-employment, business assets, and business income) are more likely to become entrepreneurs themselves. Sørensen (2007) also reported that family background is positively associated with first entry, especially when parents are self-employed during and after their children's adolescence. If founders with entrepreneurial family backgrounds benefit from this form of training, human capital acquired during their adult years is likely to reinforce this earlier training (Aldrich and Kim 2007).

Third, in this analysis, I assume that prior training and experience provide a setting for founders to develop heuristics to employ when faced with making important decisions in their start-up efforts. However, what remains unclear are the mechanisms by which founders develop these "knowledge structures" that allow them to make decisions effectively and efficiently (Walsh 1995). Integrating human capital and managerial cognition theories can lead to a deeper understanding of how founders acquire their knowledge structures and whether specific knowledge structures lead to favorable entrepreneurial outcomes. For example, founders who start new businesses in industries with established dominant designs are more likely to imitate these practices (Aldrich and Ruef 2006).

Fourth, in this analysis, I argued that founders have two short-term, low-cost strategies available to them for acquiring external knowledge. This competency-based framework can be extended to assess whether founders' human capital influence their longer-term strategies, such as hiring employees or independent contractors and purchasing specialized business services. I have also referred to short and long-term strategies somewhat generically. The timing of both sets of knowledge acquisition strategies can also be explored

in greater detail by examining whether certain types of knowledge affects other milestones during the start-up process.

Finally, founders form teams and work with supporters based on their prior relationships (Ruef et al. 2003). However, it is not clear whether accessing external knowledge through these relationships benefit the founding process. Although working with business colleagues to gain counsel and advice reduced the hazard of quitting, none of the external knowledge contributed by members of the team and support network had a similar effect. Are entrepreneurs able to weigh the benefits of working with individuals within their social and professional networks with the quality of their contributions? Founders are unlikely to make such decisions while embedded in their network of professional relationships (Granovetter 1985). Although founders benefit from the social capital generated through their existing relationships, founders may receive higher quality contributions if the recruiting decision is made independent of their relationships.

CHAPTER 4: OPEN FOR BUSINESS - FOUNDING PROCESSES AND ORGANIZING ACTIVITIES IN EMERGING ORGANIZATIONS

INTRODUCTION

In the fall of 1999, John Kim met with two colleagues for dinner to discuss the possibility of starting a new business (Morse and Lim 2006). As a ten year veteran of IBM Korea and KPMG, Kim perceived an opportunity to develop a web-based “back office” software solutions targeted at the business to business market in South Korea. Kim and his colleagues spent the rest of 1999 exploring this potential business concept. By February of 2000, they filed the necessary papers with the Korean National Tax Service in order to register NeoGenius as a legally recognized entity. They also secured office space, purchased computer equipment, and drew from their personal savings to use as initial capital for NeoGenius. During the spring and summer of 2000, the founders of NeoGenius formed partnerships with other established software vendors, filed patents, and raised additional angel funding. In November of 2000, Kim and his start-up team launched NeoSite, NeoGenius’s flagship software product designed to automate back office operations for firms in the South Korean textile industry.

From a process perspective, entrepreneurs execute multiple start-up decisions to guide their emerging organizations a series of developmental stages and transitions (Hannan and Freeman 1989; Reynolds and Miller 1992; Ruef 2005). As highlighted by the case of NeoGenius, founders attempt to mobilize sufficient resources, secure appropriate legal

recognition, create awareness among potential customers, and negotiate favorable terms with suppliers in order to develop their entrepreneurial intentions into established, viable organizations. Because these start-up activities are highly interdependent, founders may not guide their emerging organizations on a linear developmental trajectory (Aldrich and Ruef 2006; Weick 1979). Founders may delay certain activities or pursue multiple organizing pathways concurrently because of unexpected contingencies or limited resources (Baker, Miner, and Eesley 2003). Founders may also repeat organizing activities already once accomplished, such as making improvements to product designs, to generate multiple feedback loops during the founding process (Chiles, Meyer, and Hench 2004).

In this chapter, I propose a multi-dimensional, process-based approach to studying emerging organizations. I draw on process methodologies to integrate multiple organizing events to provide a richer and more complex description of the emergence process (Van de Ven and Engleman 2004). By integrating multiple organizing events, I avoid focusing on a single discrete to mark organizational founding. From this perspective, I assume that organizations emerge as founders execute plans to complete their organizing activities. Within this framework of analyzing multiple organizing events, I can also make inferences about an implicit ordering of these events. I use this process-based approach to align my empirical analyses more closely with theories of organizational founding (Aldrich and Ruef 2006).

To define the concept of organizational emergence, I draw on statements used to define established organizations. As the youngest members in an organizational population, emergent organizations should exhibit many of the properties normally associated with their older organizational counterparts. Definitions of organizations may vary in theoretical

emphasis, but they share a set of common elements. Organizations are *goal-oriented*, *bounded* entities, and participate in *exchange* activities across organizational boundaries with their environment (Aldrich 2006; Pfeffer 1997; Scott 1992). I treat emergence and its three dimensions as latent variables to form a measurement model based on multiple observable founding events. As a continuous measure, the level of organizational emergence depends on the extent to which founders progress through developmental stages and complete various organizing activities.

My approach addresses two empirical challenges. First, researchers have not agreed on standard indicators to mark organizational founding. Based on their theoretical perspectives, researchers recognize emergent organizations differently. For example, institutional theorists may emphasize adherence to regulatory frameworks, such as filing incorporation papers or obtaining business licenses to operate (Scott 2001), whereas resource dependence theorists may stress marketing actions, such as meeting with prospective clients to establish the visibility of the new venture (Pfeffer and Salancik 1978). Resource-based theorists may focus on the generation of core routines, such as unique capabilities to generate competitive advantages (Barney 1991; Nelson and Winter 1982). In contrast, organizational ecology theorists may utilize population-specific events, such as the commencement of production to indicate establishment to other members in their organizational environments (Hannan and Freeman 1989).

Second, researchers often define firm founding based on a single event for empirical convenience (Ruef 2005). To observe detailed organizing activities, researchers require appropriate empirical strategies to identify emerging firms early enough in their founding process. Researchers are also faced with the difficulties of collecting information on short-

lived attempts when approximately 50 percent of founding attempts fail to progress beyond initial organizing efforts (Aldrich and Ruef 2006; Reynolds and White 1997). Furthermore, after identifying the entire risk set of emerging organizations, researchers must employ resource-intensive data collection procedures to collect information on multiple start-up activities.

To avoid these empirical difficulties, researchers turn to archival data sources as a more convenient alternative strategy. Because archival sources typically contain limited founding information, researchers must assume that firm founding occurs with a single event. Using this assumption, researchers can devote more attention to organizational dynamics that occur in later stages of the organizational lifecycle (Aldrich and Ruef 2006).

In the following sections, I describe the importance of understanding the organizing stage within the larger context of the organizational founding process. Drawing on organizational theory, I develop the concept of organizational emergence and its three dimensions. I test this model of emergence using the Panel Study of Entrepreneurial Dynamics (PSED), a nationally representative sample of nascent entrepreneurs actively starting new businesses in the United States. After discussing results from this analysis, I conclude with the implications of using an emergence framework in organizational studies.

ORGANIZATIONAL FOUNDING AS A MULTI-STAGE PROCESS

To place this study within its proper context, I begin by outlining a process model of organizational founding. This model is based on the assumption that new organizations emerge and this emergence is characterized by a series of developmental transitions (Aldrich and Ruef 2006; Reynolds and Miller 1992). The first transition in the process model occurs when individuals consider a transition into entrepreneurship. This decision may result from

deliberate planning or can occur serendipitously (Baker et al. 2003). If the decision leads individuals to undertake specific steps to start a business, they become nascent entrepreneurs (Reynolds 1994). As nascent entrepreneurs, they are focused on transforming their entrepreneurial intentions into viable new ventures. Founders encounter organizing challenges such as mobilizing resources and developing their product or service offerings. The second transition in the process model occurs if and when founders successfully organize their new ventures. At this transition, new firms emerge as established entities and face internal and external issues of growth and survival. I now turn to a more comprehensive account of the organizational founding process.

The founding process begins when individuals make their decisions to start new businesses. Individuals evaluate several factors, such as financial resources and liquidity events (Stuart and Sorenson 2003), work experience (Brüderl et al. 1992), and abilities to uncover business opportunities (Shane 2003) as they consider this transition. Individual may also be influenced by their family backgrounds (Aldrich et al. 1998; Sørensen 2004), career trajectories (Carroll and Mosakowski 1987; Dobrev and Barnett 2005), and where they plan to locate their new businesses (Sørensen and Sorenson 2003). Prior to making the transition to entrepreneurship, individuals may seek start-up resources, acquire necessary skills, and build their social networks to increase the likelihood for establishing successful new firms. In these situations, individuals identify opportunities and then proceed to organizing their new ventures (Shane 2003).

Some individuals may decide to start a new business without intentional planning. While those who follow a *design prior to execution (DPE)* model identify a particular business opportunity prior to entrepreneurial entry, founders who encounter unplanned

business opportunities may lead to *improvisational foundings* (Baker et al. 2003). In these situations, entrepreneurs transition to entrepreneurship as a response to unexpected opportunities, such as existing clients offering guaranteed work and seed money to launch a new venture. Because some organizing actions may actually precede the decision to start a new business, founders involved in improvisational foundings may blur distinctions in the founding process.

After making the initial decision to start a new business, founders proceed to organizing their new ventures with the goal of forming established and independently organized entities. During this period, founders face challenges of accomplishing various start-up activities required to create operating organizations. In one study by Carter, Gartner, and Reynolds (1996), using a sample of 71 nascent entrepreneurs drawn from two larger representative samples, founders who reported running an operating business accomplished more activities than individuals who abandoned their start-up efforts. The founders who reported operating businesses engaged in resource mobilization activities, such as securing financing, purchasing supplies and equipment. In addition to generating revenues, founders also developed an infrastructure in their operating businesses through legal incorporation and start-up team recruitment.

During this organizing period, founders promote their emerging organizations to others. Founders who engage in legitimacy-enhancing activities, such as obtaining accreditations, securing endorsements, and attracting favorable press reviews can develop *entrepreneurial stories* about their new ventures (Lounsbury and Glynn 2001). For example, Rao (1994) chronicled how automobile manufacturers between 1895 and 1912 earned credibility and enhanced their reputations by competing and winning various certification

contests. Founders can use these citations to build recognition and communicate with other prospective stakeholders. Founders who complete a formal business plan can offer this document as a tool to communicate product concepts, management team backgrounds, and financial projections when meeting with prospective financiers and customers (Castrogiovanni 1996).

As they organize their new ventures, founders also develop strategies with an eye towards survival if their firms commence operations. Initially, because of coercive, mimetic, and normative isomorphic pressures, founders will likely craft entrepreneurial strategies that resemble those of other established organizations within their populations (DiMaggio and Powell 1983). Pressured by constraints imposed by governing bodies, founders in highly regulated industries respond by following proven strategies executed by established organizations. Because most new businesses reproduce existing organizational forms and operational procedures, founders imitate strategies implemented by successful prior foundings and learn from prior disbandings (Aldrich and Ruef 2006). Founders may draw on their work experience in similar industries and follow established professional standards in their new ventures. Founders of new ventures with radical innovations resulting in new organizational forms and entering new populations cannot rely on these established strategies and face the added difficulty of developing effective strategies of survival and growth.

After emerging into established organizations, new firms continue to face internal and external issues of growth and survival. New firms struggle to secure resources within their populations as selection pressures continue to buffet these newly established organizations (Stinchcombe 1965). According to density-dependence theories, firms disband at much higher rates in new populations due to lack of legitimacy, while new organizations entering

dense populations disband more frequently due to intense competition (Hannan and Carroll 1992). Disruptive events such as management changes in the founding team, shifts in regulatory oversight, or the introduction of competence-destroying innovations by competing organizations may affect the disbanding rate and growth of these new organizations (Anderson and Tushman 1990; Mezas and Boyle 2005; Wasserman 2003).

In the following section, I focus specifically on the period when founders organize their new ventures and propose a framework for organizational emergence. In this process model, I provide an alternative approach to examining the development of start-up efforts into newly created firms based on the organizing activities founders undertake.

DEFINING A FRAMEWORK FOR ORGANIZATIONAL EMERGENCE

New organizations are established when their founders complete their organizing activities and commence full operations. Researchers use two general approaches to identify this transition. First, in survival analyses of established organizations, organizational scholars have relied on a single event to indicate when organizations enter the risk set. With practical empirical considerations in mind, researchers often use archival data sources and must rely on key organizing events that are available in their datasets to guide their selection of an appropriate founding event (Hannan and Freeman 1989). Founding events often differ among organizational forms, such as the commencement of production for automobile manufacturers (Carroll and Hannan 2000) and legal registrations for day care centers (Baum and Oliver 1992). Similarly, management researchers focused on organizational growth identify new firms in general terms and often rely on their data sources for founding definitions. For example, Bamford, Dean, and Douglas (2004) reviewed sampling frames in studies spanning over two decades of research and found a significant number of studies that

used samples of firms based on arbitrarily assigned periods of time (e.g., “less than five years old”).

As a second approach to defining time of organizational founding, entrepreneurship researchers have used founders’ perceptions to mark when new firms become operational. For example, Carter et al. (1996) asked nascent entrepreneurs if their businesses were operating, if they were actively organizing, or abandoned their start-up efforts. In their examination of the relationship between business plans and successful start-up attempts, Honig and Karlsson (2004) used a self-reported indicator of operating status to measure if a new firm was successfully founded. Researchers who mark organizational founding with this method are dependent upon their respondents using a common definition of organizational establishment to self-report their founding status. Without this definition, researchers would require supplementary information about how founders defined organizational founding to interpret their self-reported status. Researchers would also encounter biases when confident entrepreneurs overestimate progress and less confident founders underestimate their achievements (Forbes 2005).

As an alternative approach to the two strategies I described, I propose using an emergence framework to mark the transition between organizing and operating stages. An emergence framework integrates multiple events, tracks the multi-dimensional nature of the organizing process, and accommodates non-linear organizing pathways. By relying on multiple events, the emergence approach limits selection biases that result from using samples of young firms based on arbitrarily designated founding events. This general framework applies across industries to avoid relying on founders’ perception and other socially constructed conceptions of organizational founding.

I define organizational emergence as a process in which nascent firms reflect characteristics of established organizations. The concept of organizational emergence has three dimensions: goal orientation, boundedness, and inter-organizational exchange (Aldrich 2006; Pfeffer 1997; Scott 1992). From this perspective, new organizations that fully emerge exhibit characteristics in each dimension. Goal orientation refers to the development of organizations' intended purpose and defining target outcomes (Aldrich 2006). Newly operating organizations show evidence of having goal orientation principally through development of concepts into a viable product or service; creation of an organizational identity and education of external stakeholders through external marketing; and establishing priorities for mobilizing resources through awareness of their financial needs. These actions increase emerging firms' autonomy and enable them to pursue their visions in a self-directed manner (Lumpkin and Dess 1996).

Boundedness reflects the degree to which emerging organizations distinguish themselves from other organizations within their environment. Aldrich (2006) emphasized boundary maintenance activities that founders must accomplish to allow new firms to stand on their own, apart from their founders. Organizational boundaries can emerge through intentional actions undertaken by founders as well as fulfilling requirements set by the organizations' environment. Intentional actions may involve separation of resources and liability between founders and their emerging organizations. Founders can create access to their emerging organizations for other actors in the organizations' environment such as potential creditors, suppliers, and customers. Responding to legal requirements established by the state also enables emerging organizations to gain their own identity. Firm registration

processes vary regionally, allowing entrepreneurs to establish organizational boundaries more easily in countries with minimal requirements (Djankov et al. 2002).

Inter-organizational exchange captures the extent to which organizations have developed routines to engage other organizational actors within their environment (Scott 1992). Because most organizations require external resources to accomplish their goals, organizations initially depend on other actors in their environment (Pfeffer and Salancik 1978). Activities associated with this dimension of organizational emergence involve transactions of resource inputs and product outputs with other actors in the organizational environment. Beginning with few founding members, emerging organizations resemble *bona fide groups* (Putnam and Stohl 1990). Bone fide groups stand out for their dependence on their immediate environmental context through stable, but permeable boundaries.

Because emerging organizations are highly dependent on their surroundings, founders initially rely on their personal social networks to develop transactional relationships with other organizational actors (Aldrich and Ruef 2006). Entrepreneurs may attempt to expand their network reach by seeking endorsements and introductions. For emerging organizations that survive and become established, the initial informal network of relationships may evolve into the core of a future inter-organizational exchange network (Brass et al. 2004).

In addition to its three dimensions, the organizational emergence framework has two additional features. First, the three dimensions of organizational emergence cannot be observed directly. I use continuous latent variables to measure these constructs and link them to observable activities associated with each dimension. Second, the concept does not rely on a single, discrete event that occurs at a given point in the organizing process. Instead, organizational emergence begins with the founders' initial activity and spans the entire

organizing period. By defining these dimensions as continuous measures, I can describe organizational emergence as a process with a range of intermediate thresholds. In this process model, activity occurrences represent increasing organizational emergence. Because an emergence perspective to organizational founding relies on a process-based approach, time plays an important role in explanations based on this framework. In the following section, I describe the role of time during the emergent period of new firms.

THE ROLE OF TIME IN THE ORGANIZING STAGE

As they organize, founders make progress on their start-up efforts by conducting activities that lead to firm emergence. I explore how two temporal characteristics – length of organizing time and sequential properties of organizing activities – may affect founding outcomes.

Length of Organizing Time

The time spent in organizing affects whether founders finish organizing their new ventures successfully. However, the mechanisms by which organizing time impacts the founding process remain unresolved. Hannan and Freeman (1989) offered three reasons for a *negative* relationship between organizing time and commencing operations. First, opportunity costs, such as foregone salary, increase as time spent on organizing increases. Second, competitive pressures may intensify as other entrepreneurs enter the same niche. Third, initial planning and forecasts may no longer hold as environmental conditions change, especially when founders organize over a significant period of time (Gartner and Carter 2003).

Ruef (2006) proposed the concept of *entrepreneurial inertia* to describe how longer organizing time may *positively* benefit founders. With additional time to plan, founders can

understand their competition more deeply. Founders can take advantage of their longer organizing period to enhance their ventures' credibility and to secure sufficient resources for a more effective launch. In highly regulated industries, founders require lengthy lead times to prepare accurate applications for governing bodies and receive approvals from them to commence operations. Some founders may only work part-time on their new ventures until they generate sufficient revenues to warrant further organizing. In these situations, founders can explore the viability of a concept initially without investing significant resources. For concepts that appear promising, founders may direct more resources to develop these opportunities into viable organizations.

Empirical tests of the relationship between organizing time and founding outcomes have produced mixed results, partly due to industry specific characteristics of the founding process. While Ruef (2006) showed evidence of entrepreneurial inertia in foundings of U.S. medical schools, Carroll and Hannan (2000) found that U.S. automobile manufacturers followed a non-monotonic trajectory as they organized. For these manufacturers, the rate of transition from preproduction to production stages was low for short preproduction periods (less than six months), then increased until preproduction periods reached six years, and then subsequently decreased. Mode of entry may also influence the relationship between organizing time and founding outcomes. In Ruef's (2005) longitudinal study of MBA alumni entrepreneurs, individuals who started firms independently (*de novo*) make the transition more quickly than individuals who organize new firms that spin-off from parent organizations. As one explanation, in existing organizations, individuals face structural inertia from their existing roles that hinder the ability to create roles associated with new ventures (Hannan and Freeman 1989).

Sequential Properties of Organizing Activities

In addition to how long founders organize, the time between organizing activities may also impact founding outcomes. Researchers can examine whether execution of organizing activities exhibits properties of sequential ordering. Through inductive examinations, researchers can identify global sequence types of organizing activity occurrence. Clustering algorithms generate sequence types based on user-supplied assumptions (e.g., Abbott's (1990) Optimal Matching technique). Researchers can code these sequence types for subsequent analyses or compare deductively with theoretically derived ideal-types (Pentland 2003). Other possible sequential properties include the pacing of activities (i.e., time during or between activities), frequency of each activity (if repeatable), or frequency of activities classified into categories.

Activity mapping may also reveal evidence of perfect concurrence (when activities occur at the same time) or lagged concurrence (when an activity begins prior to the conclusions of a prior event) (Ancona, Okhuysen, and Perlow 2001). For example, founders may undertake four organizing activities spanning multiple sub-processes simultaneously. Based on an inductive approach, several interpretations exist for this scenario. A basic linear interpretation suggests that the preceding and subsequent events treat the simultaneous activity occurrence as one step in a unitary sequence. By relaxing the linear sequencing assumption, an alternative explanation suggests that up to four pathways may converge at or emerge from the simultaneous event occurrence. Without explicit theoretical propositions to generate rules to resolve simultaneous events, inductive examinations limit the derivation of a comprehensive sequential explanation.

In addition to mapping activities to time directly, Poole et al. (2000) suggested examining specific subsequences of events and their interactions with external outcomes. Rather than analyzing an exhaustive inventory of activities for sequential properties, researchers could select activities based on their theoretical importance. Analyses focus on whether accomplishing certain activities predict future completion of additional activities. Longitudinal analytical techniques integrate temporal distances and determine sequential relationships among organizing activities and between activities and founding outcomes. With the availability of more detailed observations on organizing activities, researchers have reported the impact of specific activities on certain founding events. For example, analyzing a sample of Swedish nascent entrepreneurs, Delmar and Shane (2004) described how legitimating activities such as completing a business plan and establishing a legal entity led to execution of additional organizing activities in product development, marketing, and obtaining raw materials and supplies. Using Hannan and Freeman's (1989) sub-process categories, Ruef (2005) noted a sequential ordering of these ideal-type categories, based on a sample of MBA alumni nascent entrepreneurs.

I extend Poole et al.'s (2000) approach to examining sequential properties by assuming that activity occurrence indicates increasing organizational emergence. I derive sequencing properties by observing the extent to which organizing activities are accomplished at different levels of emergence. Rather than inferring temporal ordering based on a causal relationship (e.g., activity x leads to activity y), I infer sequential properties by comparing the probability of activities occurring at a given level of emergence. Higher probabilities of activity occurrence suggest earlier temporal ordering. Using this approach, I

also avoid complications related to classifying non-linear activity progression such as concurrent activity occurrences.

In the following section, I test this process model of organizational emergence. The organizational emergence framework bridges population and intra-population aspects of the founding process. I contend that the dimensions of organizational emergence – goal orientation, boundedness, and inter-organizational exchange – apply across populations because generic definitions of organizations are used to define the concept. Testing for this consistency requires a sample of emerging organizations from diverse industries. At the same time, the organizational emergence framework can accommodate intra-population differences. I expect the influence of organizing time and presence of sequencing properties to differ across industries, due to unique characteristics that distinguish organizational forms. Population-level explanations such as density-dependence arguments may provide insights into understanding these sequencing properties. I now turn to a description of my analytical approach and report results for testing the process model on emerging organizations.

DATA AND METHODS

I analyzed data from the Panel Study of Entrepreneurial Dynamics (PSED), a nationally representative sample of nascent entrepreneurs in the United States actively starting new businesses. To form the sample, a two-stage design was used. In the first stage, 59,575 adults, aged 18 years and older, residing within the contiguous 48 states of the United States, were selected between July, 1998 and January, 2000 using random digit dialing (RDD) methodology. These individuals completed a screening interview which contained four qualifying questions. Individuals qualified as nascent entrepreneurs if they expected to be majority owners of new businesses they had been actively trying to start within the last 12

months. Owners reporting firms with positive cash flow for at least three months or majority institutional ownership did not qualify. This initial screening interview resulted in a pool of 1,164 eligible individuals who could be located. From this pool, individuals were randomly drawn and invited to participate in the full study. In this second stage, 830 individuals, which included women and minority over-samples, completed the full survey, for a response rate of 71 percent. Respondents reported information on their new ventures, team members and members of their external support networks. The University of Michigan's Institute for Social Research oversaw the final data collection efforts. A complete description of the study's background, sampling methodology, and response rates can be found in Gartner et al. (2004b).

Due to various reasons, I dropped 23 cases from the final sample. Fourteen cases of the 23 cases were dropped due to lack of majority ownership by nascent entrepreneur(s) (seven cases), maturity of the new business based on three months of positive cash flow (six cases), or missing team data (one case) (Ruef et al. 2003). After reviewing start-up activity information, I dropped an additional nine cases based on four reasons: misinterpretation of questions (two cases), no reported start-up activity (three cases), and start-up too advanced based on timing of accomplished activities (four cases). In my analyses, I used an effective sample of 807 cases.

I utilized individual case weights calculated by the Institute for Survey Research at the University of Michigan for the PSED. These weights accounted for differences in selection probabilities based on age, education, race, and sex (based on the Current Population Surveys conducted by the U.S. Census) and corrected for differences due to differential non-response rates (Curtin and Reynolds 2004).

Organizing Activity Variables

To construct my measurement model, I focused on nine organizing activities: developed product/service; started marketing of product/service; created financial projections; filed Federal income tax return; opened bank account; established supplier credit; generated revenues from sale of goods/services; purchased/leased/rented equipment/facilities/property; and purchased raw materials/inventory/supplies/components. I identified these nine activities based on exploratory analyses of theoretical linkages with the dimensions of organizational emergence². For these data, I created a dichotomous variable for each activity (1=activity took place). In the initial interview, respondents reported if the activity occurred. In subsequent waves, respondents were asked the same question only if the start-up activity was not reported to take place in a previous interview.

I encountered three situations which contributed to missing data for these nine indicators. In addition to sample attrition and item non-response, a third source of missing data resulted from survey design issues. In the interim follow-up interviews, only a portion of the sample was asked the start-up activity questions. At the beginning of these interviews, respondents provided a self-assessment on the status of their new ventures using a four category response. Respondents who indicated having 1) an operating business or 2) who classified themselves as actively trying answered the start-up activity questions. The remaining respondents who reported 3) quitting the new venture or 4) classified themselves inactive were not asked the start-up activity questions. In the final wave, this screening question no longer applied so that all respondents, regardless of their status self-assessment

² In the PSED, respondents provided information on 25 organizing activities. The remaining 16 activities were not used due to their lack of theoretical linkages or poor model fit.

were allowed to respond to start-up activity questions. Based on listwise deletion, only 515 complete cases were available (approximately 65 percent of the sample).

Complete case analysis potentially produces biased results due to its assumption of Missing Completely at Random (MCAR) (Little and Rubin 1987). Additionally, because many of the dropped cases have missing data for a subset of the variables, valuable information would be lost in complete case analysis. Multiple imputation provides an alternative approach to handling missing data and requires less stringent assumptions of the data (missing at random (MAR) conditions). I used the Multiple Imputation by Chained Equations (MICE) algorithm written for STATA by Royston (2005), based on methods outlined by Little and Rubin (1987), Schafer (1997), and van Buuren (1999). I created five imputed data sets from which I tested the following models (Allison 2001).

[INSERT FIGURE 4.1 HERE]

Path Diagram

In Figure 4.1, I diagram the relationships between three first order latent variables – goal orientation, boundedness, and inter-organizational exchange – with nine observed indicators, along with the associated disturbance terms. I include a second order latent variable – organizational emergence – that influences the three first order latent variables. In Table 4.1, I provide descriptive statistics for the latent variables and their observed indicators. Occurrence of these nine activities at the final interview ranged from 68 percent (filed Federal income taxes) to 92 percent (purchased raw materials, inventory, supplies, and components).

[INSERT TABLE 4.1 HERE]

Influence of Organizing Time

The sampling frame of the PSED focused on nascent entrepreneurs who have been actively starting a new business within the last twelve months. Because qualifying for the sample only required some recent activity, some nascent entrepreneurs have organized for longer than 12 months. To assess the impact of organizing time, I included an exogenous variable to create a MIMIC model. I tested the impact of time as a direct effect on the three first-order latent variables. Testing the direct effects allows me to examine how organizing time affects each dimension of emergence. To calculate organizing time, I determined the earliest reported start-up activity date and computed the number of months from this date and the date of the first interview. The earliest reported activity date was based on 25 start-up activity variables. (See Appendix A for details.) The average organizing time was 43.3 months and ranged from 0.36 to 472.21 months. Due to the highly skewed distribution of organizing time, I used its natural logarithm.

Equations

The measurement model represented in the general equation, $\mathbf{y} = \Lambda_y \boldsymbol{\eta} + \boldsymbol{\varepsilon}$, does not hold because the categorical variables in \mathbf{y} are not normally distributed (Bollen 1989). In order to correct this violation, I replace \mathbf{y} with \mathbf{y}^* , a vector of continuous latent variables that are not directly observed, but rather underlie the observed categorical indicators (\mathbf{y}).

Therefore, the general model tested is based on the following equations:

$$\mathbf{y}^* = \Lambda_y \boldsymbol{\eta} + \boldsymbol{\varepsilon} \quad (1)$$

$$\boldsymbol{\eta} = \mathbf{B}\boldsymbol{\eta} + \Gamma \mathbf{x}_1 + \boldsymbol{\zeta} \quad (2)$$

$$\mathbf{x} = \boldsymbol{\xi} \quad (3)$$

To link \mathbf{y} with \mathbf{y}^* , an auxiliary measurement model is used.

$$y_i = \begin{cases} 0 & \text{if } y_i^* \leq \tau_1 \\ 1 & \text{if } \tau_1 < y_i^* \end{cases}, \text{ where } \tau_1 \text{ is the threshold value that determines the value of } y_i.$$

In equation (1), \mathbf{y}^* represents a vector of 9 unobserved continuous latent variables of organizing activities. The variables in \mathbf{y}^* correspond to \mathbf{y} , a vector of 9 observed dichotomous indicators. Λ_y is a vector of factor loadings associated with the 9 indicators. $\boldsymbol{\eta}$ is a vector of three first-order factors: goal orientation (η_1), boundedness (η_2), and inter-organizational exchange (η_3). To distinguish the factor loadings and their corresponding factor associations, I use the following subscript notation: λ_{ij} , where i is the number of the observed indicator (y_i) and j refers to the influencing factor (η_j). I assigned a value of 1 to λ_{11} , λ_{42} , and λ_{73} in order to scale the latent variables η_1 , η_2 , and η_3 . The measurement disturbance term, $\boldsymbol{\varepsilon}$, is associated with each variable in \mathbf{y}^* . In equation (2), η_4 represents the second-order factor (organizational emergence), \mathbf{B} is a vector of factor loadings on the three first-order factors ($\boldsymbol{\eta}$), and $\boldsymbol{\zeta}$ are disturbance terms associated with each first-order factor. x_1 represents organizing time and is a perfect measure of ξ (equation 3). Γ is a vector of coefficients for x_1 on the three first-order factors ($\boldsymbol{\eta}$). I assigned a value of 1 to β_1 in order to scale the latent variables η_4 .

Estimation

To estimate this MIMIC model, I used diagonally weighted least squares approach (DWLS). DWLS distributional requirements are not as stringent as MLE. Maximum likelihood estimation (MLE) techniques require observed variables to have a multi-normal distribution (Bollen 1989). However, with categorical variables, these assumptions are violated due to the non-continuous nature of the variables. The covariance matrix of \mathbf{y}^* does not equal the covariance matrix of the \mathbf{y} . In order to estimate the covariance matrix of \mathbf{y}^* , I

calculated tetrachoric correlations, because all observed indicators were dichotomous. Additionally, using a relatively large sample, I did not face issues associated with small samples when using DWLS. I utilized Mplus v.3, which relies on diagonally weighted least-squares with mean and variance-adjusted chi-square estimation procedures to estimate categorical endogenous latent variables. I identified the model using the MIMIC and three-indicator rules (Bollen 1989).

[INSERT TABLE 4.2 HERE]

RESULTS

Model Fit and Evaluation

I assessed overall model fit by evaluating five fit statistics: mean correlation residuals, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and model chi-square. In Table 4.2 (Model 1), I report values of these fit measures for the overall model by averaging values across the five imputed datasets. These statistics indicated a fairly good fitting model. The mean value of the correlation residuals was -0.01, with values close to zero indicating good model fit. The values for the CFI, TLI, and (1-RMSEA) statistics were at or above 0.95, a generally accepted threshold for good model fit. However, the statistically significant model chi-square statistic indicated a poorly fitting model. Because the other four model fit statistics indicated good model fit, I attribute the statistically significant model chi-square to excessive statistical power from the relatively large sample ($n=807$). The chi-square test statistic may have detected small departures in the implied covariance matrix from the population covariance matrix.

Industry Similarity - Multiple Group Analysis

To assess model fit across industrial sectors, I conducted a multiple group analysis by first assigning each case to one of four categories – primary/manufacturing/transportation, retail/wholesale, consumer/support services, or professional services – based on the 1997 NAICS coding scheme. I allowed factor loadings and thresholds to estimate freely across all four groups to test measurement form invariance. The models for all four industrial sectors fit well, suggesting form invariance across these groups based on the overall model. I report fit statistics for the multiple group analysis in Table 4.2 (Model 2). Mean correlation residuals ranged from -0.01 to -0.02. CFI, TLI, and 1-RMSEA values were at or above 0.95. Again, I attribute the statistically significant model chi-square to excessive power.

Testing measurement form invariance across all four categories required that all nine start-up activities were theoretically appropriate within each industrial sector. To test whether certain activities were affected by population level characteristics, I tested an alternative model. I allowed one indicator in each of the three dimensions - y_3 (created financial projections), y_6 (established supplier credit), and y_9 (purchased raw materials, inventory, supplies, components) – to vary in form across all four categories. The level of importance placed on these three activities can differ across populations, whereas the remaining six activities have generic qualities that apply across populations. For example, founders in resource intensive industrial sector, such as manufacturing, may view these three organizing activities differently than founders who start service-related businesses that require minimal initial resources. For this revised analysis, model fit statistics remained similar to the original multiple group analysis (results not shown). Based on these results, within each industrial

sector, I conclude that emerging organizations exhibit goal orientation, boundedness, and inter-organizational exchange characteristics.

[INSERT TABLE 4.3 HERE]

Component Fit and Substantive Findings

In Table 4.3, I present model coefficients and their R^2 values in columns 1 – 7 for the overall model. In terms of component fit, I reviewed the direction of coefficient estimates for Λ_y and the squared multiple correlation coefficients (R^2) for each indicator. Directionally, each coefficient estimate appeared reasonable. The R^2 values indicated that the observed indicators provided sufficient explained variance of the underlying latent variables. All R^2 values were near 0.50 or greater. Furthermore, there were no negative R^2 values or estimated correlations between two variables greater than one. I encountered a negative residual variance for the goal-oriented latent factor in four situations (overall model, primary/manufacturing/transportation, consumer/support services, and professional services industrial sectors). These values were close to zero and not statistically significant. I attributed these results to sampling fluctuation (Bollen 1989).

To assess sequential properties based on the extent to which certain start-up activities have occurred in emerging organizations, I transformed factor loadings into predicted probabilities. Because an auxiliary measurement model was used to link \mathbf{y} and \mathbf{y}^* , the transformation provided a substantive interpretation of the impact of the latent variable (η_4 – organizational emergence) on \mathbf{y} . For specified values of η_4 , I calculated predicted probabilities from the factor loadings based on the following formula:

$$\Pr(y_j=1|\eta_4) = F[-(\tau-\lambda)\eta_4/\text{sqrt}(\theta)] \quad (3)$$

where τ is the threshold value for y_j , λ is the factor loading for y_j , η_4 is the value of organizational emergence, and θ is the residual variance of y_j (Muthén and Asparouhov 2002). Because the model contained a second-order factor, I accounted for indirect effects of the second-order factor (**B**) by multiplying these coefficients with their respective factor loadings. I use this value ($\beta_j * \lambda_j$) (shown in Table 4.3, column 4) for the factor loading term (λ_j) in equation 3. The predicted probability is the standard normal cumulative distribution of calculated in equation 3, which is shown in Table 4.3, columns 8, 9, and 10. I used three values of organizational emergence based on its standard deviation ($-\sigma$, 0, and σ) in the probability calculations and to calculate a range of probabilities for activity occurrence. The standard deviation (σ) was 0.79 for the organizational emergence latent factor. I also calculated marginal effects for each activity to explore the range of probability change. In columns 12 and 13, I show the actual and percent changes in the predicted probabilities between one standard deviation above and below the mean (henceforth: $-\sigma$ to $+\sigma$).

Based on the overall model (Table 4.3), I observed a pattern of organizing activities among the three dimensions of organizational emergence. New ventures started with goal orientation activities (48 to 81 percent change) and proceeded to inter-organizational exchange activities (67 to 240 percent change) and boundary forming activities (154 to 1,130 percent). When the value of organizational emergence was set to one standard deviation below its mean, the predicted probabilities were greater than 0.50 for three goal orientation activities and one inter-organizational exchange activity. Although these results suggested a general organizing sequence, industry level analyses provided a more comprehensive account of these sequencing properties.

[INSERT TABLE 4.4 HERE]

[INSERT FIGURE 4.2 HERE]

The results from the industry level analyses revealed four types of sequencing properties corresponding to each industrial sector. In Table 4.4, for each sector, I summarized the changes in predicted probabilities between $-\sigma$ to $+\sigma$. Smaller changes in predicted probabilities indicated earlier occurrence of these activities in the organizing process. In Figure 4.2, I graphed the predicted probabilities for each industrial sector to show the likelihood of activity occurrence during early organizational emergence (three standard deviations below the mean to the mean value of organizational emergence). To improve the clarity of the graphs, I displayed only selected probability curves.

Emerging firms in primary, manufacturing, and transportation sectors followed a *marketing and mobilization prior to sales (MMPS)* process. Founders in these ventures began marketing their products and services very early in their organizing stage. In Figure 4.2a, the predicted probability curve for the marketing activity is the left-most curve, indicating a high probability of occurrence at low levels of emergence. The predicted probability for marketing to occur at three standard deviations below the mean was 0.58, which was the highest value for any activity across all four industries at this level of emergence. Several resource mobilization activities followed, such as establishing supplier credit, calculating financial projections, assembling supplies, and securing property and equipment. For these four activities, the changes in predicted probabilities from $-\sigma$ to $+\sigma$ were low (0.51 or lower). I offer one explanation for the sequence of these resource mobilization activities based on Figure 4.2a. Initially, the predicted probability curve for materials purchases remained above the supplier credit curve (until -2σ below the mean value of emergence). During this period of emergence, founders acquired their initial allotment of raw materials and supplies using

personal resources. Through initial marketing efforts, founders attained some legitimacy with their suppliers who provided credit to the new business for additional purchases. At two standard deviations below the mean level of emergence, the curves for materials purchases and supplier credit intersected. With the higher likelihood of supplier credit availability, founders began to acquire property and equipment.

When compared to the other three sectors, revenue generation occurred latest in the emergence process for the primary, manufacturing, and transportation sectors. Although initial sales took place relatively late, the likelihood for founders to generate their initial revenues happened within a short period of emergence. The predicted probability for this activity increased from 0.10 (at one standard deviation below the mean) to 0.91 (at the mean value of organizational emergence). The delay in initial sales may result from significant lead times necessary to create and sell capital intensive products. Receiving regulatory approvals may also increase the time between initial organizing activity and generating sales. However, once the developed products obtain their approvals, initial sales occur shortly afterwards.

New ventures in professional services followed a *planning and development prior to sales (PDPS)* process (Figure 4.2b). In this sector, activities such as creating financial projections, developing and marketing the service, and securing supplies occurred early in the organizing stage. The changes in predicted probabilities from $-\sigma$ to $+\sigma$ ranged from 0.32 to 0.50 for these activities and were among the smallest of the nine activities, indicating their early occurrence in the emergence process. Purchasing, leasing, or renting equipment/property occurred with initial sales late in the emergence process. Starting a professional services business may require low initial overhead, such as conducting operations within the founders' homes. However, as emerging firms generate sales, founders

may open an office or secure additional equipment. Change in predicted probabilities from $-\sigma$ to $+\sigma$ was 0.75 for securing equipment/property and 0.81 for generating initial sales. In general, the activities in the professional services sector occurred gradually, represented by the flatter predicted probability curves.

Retail/wholesale ventures exhibited a *compressed* activity sequence (Figure 4.2c). Seven of the nine organizing activities occurred early in this sector, with changes in predicted probabilities from $-\sigma$ to $+\sigma$ of less than 0.50. The small changes in probabilities indicate an accelerated pace in emergence for retail/wholesale ventures. At $-\sigma$, the predicted probabilities for the seven activities were greater than 0.50. I display five of the seven activities in Figure 2c (product development, property acquisition, inventory acquisition, generating sales, and establishing supplier credit). Initial sales occurred the earliest, compared to the other three sectors.

In contrast to the rapid pace of retail/wholesale ventures, consumer/support services ventures displayed an *extended* organizing sequence and emerged at a much slower pace (Figure 4.2d). Changes in predicted probabilities were greater than 0.60 in eight of the nine activities. Founders in consumer/support services ventures projected financials early but took more time to organize. After some initial planning, these founders may have proceeded informally by slowly formalizing their concepts. Although not shown, five additional activities occurred nearly at the same probabilities with the three activities (securing supplies, generating sales, and acquiring credit) shown in Figure 4.2d. Given the longer timeframe, founders of these ventures delayed committing full-time to their new ventures. For example, a nascent entrepreneur could be working full-time while starting a business during the evenings or on weekends. Among the four industrial sectors, founders secured raw materials

and other supplies the latest. The change in predicted probabilities (0.66) was highest among the four sectors. This may indicate evidence of entrepreneurial bricolage, as resource constrained founders “make do” with existing resources to build their businesses (Baker and Nelson 2005).

I found partial support for a relationship between organizing time and emergence. New venture age had a statistically significant positive relationship on achieving only one dimension (inter-organizational exchange) in the overall model. The multiple group analysis revealed a statistically significant relationship in two situations. In consumer/support services ventures, organizing time had a positive relationship with achieving the inter-organizational exchange dimension ($\gamma_3 = 0.16$). By combining these results with the sequencing explanation, founders in consumer/support services ventures may actually benefit from lengthy organizing timeframes. Entrepreneurial inertia may provide these nascent entrepreneurs opportunities to secure adequate resources or test their concepts sufficiently to increase their likelihood for creating a viable new firm (Ruef 2006). In retail/wholesale ventures, organizing time had a negative relationship with achieving the goal orientation dimension ($\gamma_1 = -0.18$). Given the rapid organizing pace of retail/wholesale ventures, founders may not formally complete the planning and development activities associated with this dimension. In the remaining sectors, founders did not appear discouraged from continuing work on their start-up attempts over an extended period of time.

DISCUSSION

In this paper, I proposed an emergence framework to explain how founders organize their new ventures within the context of the firm creation process. Based on properties of organizations developed by Aldrich (1979) and Katz and Gartner (1988), I described three

dimensions of organizational emergence: goal orientation, boundedness, and inter-organizational exchange. I developed a measurement model that links latent characteristics of new organizations with nine organizing activities as observed indicators. With a multi-dimensional approach to examining organizational founding, I provide an alternative to using single founding events or founders' self-evaluation of organizing status to mark firm creation. The organizational emergence framework also provides a continuous measurement option for marking progress made by founders during the organizing stage. A continuous measure provides a richer, more nuanced understanding of start-up processes of emerging organizations over discrete event indicators. Discrete measures may provide empirical convenience in some situations (e.g., archival data). However, using discrete indicators can censor partially operating organizations that have not fully emerged. I also explored the role of two temporal characteristics, the length of organizing time and sequential properties of organizing activities.

Using data from the PSED, I tested this process model of emergence. Three results stood out. First, the organizational emergence framework exhibited good model fit across four industrial sectors. Second, sequencing properties of organizing activities differed across industrial sectors. Manufacturing/transportation start-ups displayed evidence of early marketing and resource mobilization activities. Start-up attempts in professional services revealed early planning and development actions. Retail/wholesale ventures organized quickly, while consumer/support services ventures organized over a much longer timeframe. Third, organizing time partially affected organizational emergence in the retail/wholesale and consumer/support services sector. These results provide an empirical extension to Katz and

Gartner's (1988) proposal for identifying and examining properties of emergent organizations.

Given the limited support for a relationship between length of organizing time and emergence, researchers who study organizing processes using the PSED may not be hampered by left-truncation issues related to organizing time. Some have argued that the sampling strategy to identify nascent entrepreneurs employed in the PSED overlooked shorter organizing efforts (Gartner, Carter, and Reynolds 2004a). To address this concern, researchers could define an "organizing window" and exclude any organizing efforts that began outside of this window. For example, Delmar and Shane (2004) restricted their analyses to ventures that initiated their organizing activities within 24 months of the initial interview. Without conclusive results on the relationship between organizing time and emergence, researchers using an organizing window will lose valuable information (by dropping cases) and potentially define their organizing window arbitrarily.

The organizational emergence framework does not explicitly integrate two commonly studied start-up processes: social organization and business planning. When conducting social organization activities, founders may recruit other collaborators by offering equity in the new business, hire initial employees, and take steps to establish a human resources infrastructure (Aldrich and Ruef 2006; Hannan and Freeman 1989). Although Ruef (2005) found evidence of social organization occurring prior to operational start-up, founders may only conduct these activities when starting certain types of businesses, such as capital intensive manufacturing start-ups that require significant labor. In the PSED, approximately 1/3 of nascent firms hired an employee during the five year observation period and 85 percent of new businesses had only one or two owners. For most newly operating firms,

social organization activities may either occur after organizations fully emerge or in the case of solo or two person ventures, may not apply at all.

Scholars have debated the role and impact of business planning in the organizing process. Castrogiovanni (1996) suggested that business planning does not lead directly to founding outcomes, but instead, generates benefits such as creating a communication vehicle, developing organizational knowledge and identifying operational efficiencies. Honig and Karlsson (2004) argued that coercive and mimetic institutional pressures encourage nascent entrepreneurs to write business plans. Delmar and Shane (2003) reported that business planning positively affects the survival of new ventures. The organizational emergence framework does not explicitly include an indicator for completing a formal business plan, but relies on activities such as financial planning, product development, and market promotion activities that a formal planning exercise requires.

I describe four limitations to this study and its findings. First, incorporating additional observed indicators of organizing activities may provide additional substantive insights. Although the nine activities used in the measurement model exhibited good model and component fit, integrating other organizing activities into the model may provide additional insights. Further testing within industrial groups may lead to more nuanced models incorporating industry specific activities (e.g., applying for patent protection in technology oriented businesses).

Additionally, due to lack of measures in the PSED, the measurement model does not specifically integrate direct indicators of legitimacy and other institutional-related activities for the boundedness dimension. Depending on the regulatory setting of the nascent firms, using indicators such as legal incorporation and business licensing to measure firm

boundedness may lead to different conclusions on the sequencing of boundary creating activities. In certain regions of the United States, nascent entrepreneurs may operate as sole proprietors or in general partnerships without filing any incorporation papers with their local governing entities. Approximately 50 percent of nascent entrepreneurs in the PSED reported sole proprietor status, raising the importance of contextualizing the use of firm registration as a start-activity indicator. In their study of new businesses in Munich, Germany, Brüderl, Preisendörfer, and Ziegler (1992) pointed out nearly 20 percent of their original sample (created from firm registrations) were not intended to be active businesses, but were created to take advantage of local tax deductions. Djankov et al. (2002) described how firm registration processes differed substantially between regions in their study of 85 countries.

Second, similar to other studies on organizing activities, I relied on organizing activity information based on their first occurrence (Delmar and Shane 2004; Lichtenstein et al. 2005; Ruef 2005). Measuring activities at first occurrence serves as a first approximation to alternative methods of mapping these organizing activities to time, such as frequency of and intervals between occurrences (Ancona et al. 2001). For recurrent organizing activities, using first occurrence may not capture the full extent of how emerging organizations achieve a threshold level of development within each dimension. Activities such as resource acquisition or generating sales may occur slowly in early stages of development but may intensify subsequently. Capturing such information would deepen the theoretical understanding of the emergence process, but require considerable additional data collection. Additionally, organizing time may have a different relationship with emergence because of the inclusion of repeated activity occurrences. Using first occurrence to mark recurrent activities also may lead to measurement error in some cases. For example, respondents who

initiated new ventures as improvisational foundings may have purchased equipment or supplies closely associated with their previous occupations. To address this concern, I reviewed the cases for any inconsistent responses to the occurrence of start-up activities. I described these steps in Appendix A.

Third, I used industrial sectors based on two digit NAICS industrial codes. Although sequencing properties differed among the four industrial sectors, the broad industrial categories may have obscured unique features of specific populations within the sectors. Focused population-level studies may yield additional insights. For example, studying a sample of emerging organizations in one sector allows for a comparison of sequential properties among diverse organizational forms within the sector. In these focused studies, additional relationships between organizing time and emergence may emerge.

IMPLICATIONS AND FUTURE DIRECTIONS

Using an emergence framework to study the organizing stage makes two important contributions to organizational theory. First, by disaggregating the founding process into distinct stages, researchers can probe more closely at the transitions between stages and the factors that impact these transitions. From this perspective, analysis of emerging organizations connects multiple streams of research in entrepreneurship and macro-organizational behavior. Researchers can improve the precision of how determinants of entrepreneurial entry contribute to mechanisms of completing the organizing stage and dynamics of organizational growth and survival. Using a structural modeling framework, researchers can examine the impact of exogenous factors (such as resource availability or environmental conditions) on transitions between multiple stages concurrently. In these models, organizational emergence would act as an intervening variable and impact

subsequent outcome measures such as new venture performance and survival. This approach also enables researchers to avoid selection biases that may lead to inaccurate conclusions if sampling designs do not account for all actors at risk for the transition outcomes (Aldrich 1999). Because organizing time does not influence all emerging organizations, studies in certain industries that rely on pre-defined organizing timeframe should consider the impact of excluding attempts that have taken longer to organize.

Second, the emergence framework spurs new interpretations of existing accounts of firm founding processes and complements existing research on other stages of the founding process (Chiles et al. 2004). Examining the activities that occur during the organizing stage provides opportunities to join macro-level theoretical propositions of organizational founding with micro-level foundations and processes (Hannan and Carroll 1992). For example, age-dependency theories derived from Stinchcombe's (1965) liabilities of newness thesis contain two opposing arguments (Carroll and Hannan 2000). Lack of resources, organizational knowledge, and legitimacy support a negative age-dependency argument, while imprinting and structural inertia provide an alternative positive age-dependency explanation. However, these existing explanations depend on a single founding event to mark firm establishment. When applying a multi-dimensional emergence framework, alternative explanations become apparent. The liability of adolescence explanation suggests that organizations encounter greater disbanding pressures after depleting initial resources (Brüderl and Schussler 1990; Fichman and Levinthal 1991). From an emergence perspective, the lower disbanding rate among younger organizations may highlight those attempts still progressing in the organizing stage. Once firms emerge completely out of the organizing stage, age-dependency reverses as operating firms encounter competitive pressures within their populations. The emergence

perspective provides opportunities to combine competing explanations for age-dependency across multiple stages in the founding process.

CHAPTER 5: CONCLUSION

In this dissertation, I examined how Stinchcombe's (1965) *liabilities of newness* argument applied to the emergence of new firms. During the period of organizational emergence, founders face the task of expanding their networks beyond their strong ties in order to acquire external entrepreneurial knowledge and other forms of support. I addressed two research questions – the role of founders' support networks and founders' ability to acquire external knowledge – based on Stinchcombe's argument. I also pursued a third research question – developing a multi-dimensional approach to identifying emerging organizations – to revisit the assumption used by organizational scholars that firm foundings are discrete events. In this concluding chapter, I summarize my findings, discuss limitations encountered, and outline future extensions to this research.

In the introductory chapter, I outlined three empirical challenges encountered by researchers who study the processes of emergence in new firms. First, researchers should identify founders and their emerging firms early in their start-up process to reduce the impact of survivor bias in their analyses. Second, researchers should collect in-depth information on both founders and their new businesses to understand how founders' characteristics influence the development of their businesses. Third, researchers should track progress of these new ventures and their founders over time. I used the Panel Study of Entrepreneurial Dynamics (PSED), a random sample of 830 nascent entrepreneurs in the United States, collected in four waves between 1998 and 2003 to examine these research questions. The PSED was designed to address these three empirical challenges.

In Chapter 2 (“Too Close for Comfort”), I explored how founders form their support networks from which to solicit assistance, advice, and other forms of backing during the start-up process. I drew from social capital and social exchange theories to hypothesize that founders are more likely to work with their strong ties due to norms of reciprocity that guide these relationships. I also hypothesized that founders who work with weak and indirect ties can benefit from their negotiated exchanges. I found that founders work closely with one subset of their strong ties: family members. As the number of family ties among owners and supporters increases, founders were more likely to quit their new ventures.

In Chapter 3 (“Rounding out the Team”), I examined how founders’ human capital guides their acquisition of external entrepreneurial knowledge. Based on human capital theory, I hypothesized that as founders’ human capital increases, they are less likely to solicit general knowledge, but more likely to solicit specific knowledge externally. I also relied on social capital theory to hypothesize that founders are more likely to solicit entrepreneurial knowledge from their professional colleagues. I found that founders relied on their specific human capital and looked to business associates and strangers to seek external knowledge. Founders who received external knowledge in the form of advice and business services were less likely to quit their start-up efforts.

In Chapter 4 (“Open for Business”), I developed a multi-dimensional approach to identifying emerging organizations as an alternative approach to discrete events used by most organizational scholars. I developed properties of new organizations – goal orientation, boundedness, and inter-organizational exchange – from sociological definitions of established organizations. I linked organizing activities to these latent dimensions of

organizational emergence as observed indicators. Using this multi-dimensional model, I found that emergence processes differed across industrial sectors.

Although the survey design used in the PSED addressed several empirical challenges faced by entrepreneurship researchers, I encountered four broad limitations in my dissertation work. These limitations were industry heterogeneity in the sample; lack of complete network information; assumption of a linear developmental trajectory; and sample attrition over time. I describe these four limitations and possible extensions for future research in further detail.

First, because it relied on an individual-level sampling strategy, the PSED contains information across a wide range of industries. By utilizing this sampling design, the PSED avoided the difficulties of identifying nascent entrepreneurs within specific industries and allowed for analysis to generalize to the entire US population. However, some organizational scholars have argued that cross-industry samples complicate analyses due to the inability to control for unobserved heterogeneity associated with multiple industries (Carroll and Hannan 2000). According to this perspective, researchers who conduct industry-specific studies can generate deeper insights by controlling for the diversity of organizational form. To assess whether results remain consistent, researchers would replicate their industry-specific studies across other industries to develop more generalized observations. In future research, industry-specific studies of nascent entrepreneurs may be used to expand findings generated from the randomized sampling design. These focused studies can also provide opportunities to explore specific emergence processes that are only relevant to particular organizational populations, such as fulfilling legal guidelines in highly regulated environments. Focused studies may also be more appropriate when examining start-up processes in firms that represent new organizational forms. However, in order to conduct these focused studies,

appropriate methodologies are required to identify nascent entrepreneurs and their organizing efforts in early stages of emergence, especially if large samples are required for analyses.

Second, although the PSED collected respondents' team and support network characteristics, it did not capture additional network information on the respondents' broader social and professional network. Although my analyses indicated that founders relied heavily on their existing direct ties, it is not clear to what extent these direct ties form the basis of their entire social network. In future research, having additional network information such as direct reports from alters, directional ties information, and relationship history information (i.e., did alter work with founder on a prior start-up) may reveal additional insights into how and on what basis founding teams and their support networks emerge.

Recent network studies utilize empirical settings, such as large, multi-national or multi-divisional corporations that have well-defined boundaries and sufficient potential social ties among members to test various social network theories (e.g., Burt 2005; Hansen, Mors, and Løvås 2005). This type of bounded setting is suitable for exploring questions of entrepreneurial innovation and knowledge transfer. However, identifying bounded empirical settings to collect extended networks for nascent entrepreneurs may be more difficult. Several possible approaches can be considered. First, researchers can expand the ego-based data collection design used in the PSED. In addition to collecting information on up to five co-owners and five additional helpers, interviewing each of these alters directly will likely provide researchers with additional information on how founders develop collaborative partnerships during the start-up process. Second, following in the tradition of early network studies, researchers may identify a "community" of entrepreneurs, such as those affiliated with business incubators, local trade associations, industrial parks, or economic development

districts. Using their affiliations with these entities, researchers can explore to what extent founders' extended ties overlap one another and the role these ties play in supporting their start-up efforts. Third, researchers can employ a hyper-sampling approach to identify founders and their extended networks in a particular region by initially sampling key network brokers, such as lawyers, bankers, and accountants (McPherson 2001). After identifying the entrepreneurs, researchers can follow up with a more detail network survey soliciting information on their collaborators. The objective of these alternate data collection strategies is to gather additional information on the composition and content of founders' extended networks and track any changes to these networks over time.

Third, the PSED survey design assumed a linear development trajectory for new ventures. From this perspective, once a particular organizing activity occurred, the PSED did not record any subsequent progress on this particular activity accomplished during the emergence process. For example, in terms of generating sales, the PSED did not collect information on whether ongoing revenues were generated after the initial sales occurred. In future research, repeated measures on organizing activities and other indicators of ongoing progress would be necessary to explore a more complex emergence model. With this additional information, researchers can test theories of organizational learning and developmental feedback. For example, do intra-organizational learning mechanisms observed in established organizations also apply to settings where organizational infrastructure continues to emerge? Or do founders have opportunities to experiment as their new ventures develop or are start-up pressures too significant to expend limited resources in this way?

To capture this additional level of detail, researchers may opt to employ an inductive, qualitative approach to establish baseline processes and pretest possible questions for a

survey-based study. For example, when meeting with founders, researchers can request current financial statements, marketing programs, market research, and other materials that provide ‘real-time’ assessment of the new ventures’ development (e.g., Lichtenstein, Dooley, and Lumpkin Forthcoming). Researchers can also ask founders to journal their progress (e.g., in an online blog or written diary) and note any developmental challenges as they occur. To increase the efficiency of this approach, researchers may elect to select cases based on certain industries to take advantage of their relative start-up timeframe. For example, retail start-ups are more likely to progress rapidly and may require a strategy to capture progress more frequently compared to capital intensive manufacturing ventures.

Fourth, due to sample attrition, PSED users must take steps in their longitudinal analyses to accommodate missing data. Although considerable effort was made by the survey research firm to minimize the number of lost respondents, the PSED achieved just below 75 percent retention of the original respondents at the second interview and retained slightly more than 50 percent at the fourth and final interview. Without these data, researchers would need to employ multiple imputation techniques to analyze a complete sample.

To improve sample retention in future panel studies, researchers can pursue two strategies: reduce the interval between interviews and modify the criteria that qualifies individuals as nascent entrepreneurs. The PSED contacted respondents at approximately 12 month intervals. Given sufficient resources, more frequent interactions with founders would likely reduce sample attrition and improve founders’ recall of key information. For example, a replication of the PSED in Sweden contacted respondents every six months during a two year period and achieved over 90 percent response rate for each wave (Delmar and Shane Forthcoming). More frequent interviews can lead to improved respondents’ recollection for

time sensitive information regarding their new ventures' progress and individuals with whom they collaborated.

A second approach to improving sample retention is to modify the criteria that qualify respondents for the survey. The PSED's four-part criteria provided researchers with an initial approach to identify and qualify nascent entrepreneurs. In order to qualify, respondents reported being in the initial stages of starting a business, undertook some activity within the last twelve months, anticipated majority ownership, and did not generate positive cash flow for more than three months. The definition of "starting a business" was not pre-defined and supplied to the respondents. Thus, some respondents may have interpreted this statement more broadly than what researchers may have intended. For example, based on reviews of qualitative responses to a question on why respondents decided to pursue starting their businesses, a number reported that the business venture in question was also considered a hobby for the respondents. Because respondents may have sold a few projects to friends and neighbors, the hobby may be construed as a fledgling business venture and consequently, respondents would qualify for the survey. However, the respondents may simply intend to continue as a hobbyist. Additional analyses of the respondents who dropped out of the sample, especially those who only completed the initial interview may yield common characteristics that can be used to improve the definition and the qualifying criteria of nascent entrepreneurs in future research.

Some questions still remain unresolved. First, given the liability of newness associated with working primarily with close ties, can founders establish more optimally configured support networks? What are the antecedent processes that allow founders to form these ideal-type networks? Can founders avoid this liability by acting "strategically" in their

network development? Second, by using the multi-dimensional approach to identifying emergent organizations, how would results from previous research on age-dependency of organizations change? Hannan & Freeman (1992: 197-200) acknowledged that exploring issues related to founding processes contribute to the “micro-foundations” of organizational ecology theory. Because of data limitations, they admitted to difficulties in developing these micro-foundations and thus favored macro theory testing with population-level data. By using the multi-dimensional approach to identifying new firms, new interpretations of survival trajectories may emerge, especially during their earliest periods of firms’ existence.

Third, do founding processes remain consist across multiple forms of entrepreneurial action? As a representative sample of nascent entrepreneurs in the United States, the PSED captured information on founders whose motivation ranged from part-time supplemental work on their new ventures to joint work with a spouse as a potential ‘life-style’ business to full-time pursuit of a successful business opportunity. Thus, does founders’ initial motivation affect the processes they undergo to launch their ventures? Does it also explain why some founders persist in their pursuit of business opportunities? For example, five percent of founders reported that their first activity on their current ventures occurred 12 years or earlier prior to their interview. Although most entrepreneurship research tends to focus on quick starters, examining entrepreneurial activity within a lifecourse framework may help explain how entrepreneurial entry may coincide with other life transitions (Aldrich and Kim 2007). Thus, individuals who ‘tinker’ with a business opportunity may also need to delay entry in order to accumulate sufficient financial resources or work experience.

To conclude, founders encounter *liabilities of newness* as they transform their business concepts into viable, operating new businesses. Due to relationships in which they

are embedded, founders rely on their strong ties for support and expertise. As Stinchcombe (1965) predicted, founders face the risk of failure if they rely solely on the convenience of soliciting assistance through these relationships. Future research, especially in terms of focused, industry-specific studies, may yield additional insights into how Stinchcombe's argument applies to emerging organizations and their founding processes.

Table 1.1: Strengths and Limitations of Data Sources for Studying Entrepreneurs

Data Type	Data Sources	Strengths to Studying Entrepreneurs	Limitations to Studying Entrepreneurs	Selected Citations
Longitudinal Surveys	National Longitudinal Surveys; Panel Study of Income Dynamics	<ul style="list-style-type: none"> • Observations of transitions into self-employment over time • Ability to model delayed impact of key variables (e.g., financial) • Ability to study intergenerational effects 	<ul style="list-style-type: none"> • Restricted to certain populations (e.g. White, Young Men) • Samples size reduces over time due to attrition • Cohort effects 	<ul style="list-style-type: none"> • Evans and Jovanovic (1989) • Evans and Leighton (1989) • Fairlie (1999)
Tax Records	Internal Revenue Service Tax Returns	<ul style="list-style-type: none"> • Assess specific variables related to legal formation of start-up and financial resources 	<ul style="list-style-type: none"> • Lack of key control variables, such as race and education 	<ul style="list-style-type: none"> • Holtz-Eakin et. al. (1994)
Census	Current Population Surveys	<ul style="list-style-type: none"> • Ability to study impact of wage earnings on the decision to be self-employed 	<ul style="list-style-type: none"> • Quality of wage data raises complications in analysis 	<ul style="list-style-type: none"> • Devine (1994) • Fairlie and Meyer (1996)
Social Surveys	General Social Surveys	<ul style="list-style-type: none"> • Rich demographic information over time 	<ul style="list-style-type: none"> • Not focused on entrepreneurs 	<ul style="list-style-type: none"> • Butler and Herring (1991) • Hout and Rosen (2000)
Businesses	Characteristics of Business Owners; Dun and Bradstreet	<ul style="list-style-type: none"> • Large samples • Over-sampling of females and minority groups • Industry specific analytical capabilities 	<ul style="list-style-type: none"> • Selection bias towards examining existing businesses 	<ul style="list-style-type: none"> • Bates (1997)
Survey of Entrepreneurs	Panel Study of Entrepreneurial Dynamics (PSED)	<ul style="list-style-type: none"> • Targeted at entrepreneurs • Specific measures of background characteristics 	<ul style="list-style-type: none"> • Comparison group not sampled from primary sample of nascent entrepreneurs 	<ul style="list-style-type: none"> • Gartner et. al. (2004b)

Table 2.1: Descriptive Statistics for Founding Team and Support Network Characteristics

Variable	Std.				1	2	3	4	5	6	7	8	9
	Mean	Dev.	Min	Max									
1 Number of supporters (total)	2.09	4.36	0	50	1.00								
2 Number of supporters (kin)	0.46	0.88	0	5	0.35 *	1.00							
3 Number of supporters (non-kin)	0.97	1.31	0	5	0.18 *	-0.05	1.00						
4 Team size	1.69	0.90	1	5	-0.05	-0.07 *	-0.13 *	1.00					
5 All male team	0.43	0.49	0	1	0.00	-0.11 *	0.13 *	-0.21 *	1.00				
6 All female team	0.25	0.43	0	1	0.06 *	0.16 *	0.08 *	-0.33 *	-0.49 *	1.00			
7 Mixed gender team	0.05	0.22	0	1	0.05	0.04	-0.04	0.33 *	-0.20 *	-0.13 *	1.00		
8 Teams with spousal pairs	0.28	0.45	0	1	-0.08 *	-0.06	-0.20 *	0.38 *	-0.53 *	-0.35 *	-0.14 *	1.00	
9 Number of non spousal kin ties (team)	0.21	0.93	0	10	0.01	0.08 *	-0.03	0.52 *	-0.11 *	-0.07	0.24 *	0.07	1.00
10 Team age heterogeneity	2.67	4.67	0	27.58	-0.07	-0.03	-0.09 *	0.60 *	-0.10 *	-0.19 *	0.28 *	0.15 *	0.43 *
11 Ethnic diversity (team)	0.08	0.28	0	1	-0.07	-0.08 *	-0.09 *	0.26 *	-0.08 *	-0.13 *	0.10 *	0.17 *	-0.02
12 Primary/manufacturing start-up	0.15	0.36	0	1	-0.04	-0.01	-0.04	0.04	0.10 *	-0.15 *	0.01	0.03	0.03
13 Retail/wholesale start-up	0.25	0.43	0	1	-0.01	0.03	-0.01	-0.04	-0.08 *	0.08 *	0.01	0.01	-0.02
14 Consumer services start-up	0.34	0.47	0	1	0.05	0.00	-0.01	-0.01	-0.02	0.00	-0.04	0.04	0.02
15 Business services start-up	0.26	0.44	0	1	-0.02	-0.02	0.05	0.02	0.02	0.04	0.02	-0.08 *	-0.02
16 Proportion with start-up experience (team)	0.47	0.45	0	1	0.04	0.02	0.09 *	-0.03	0.06	0.04	0.01	-0.11 *	-0.03
17 Average industry work experience (team)	8.09	8.19	0	50	0.01	-0.02	0.02	-0.05	0.09 *	0.00	-0.02	-0.08 *	-0.03
18 Organizing time (months)	43.55	56.21	0.36	472.21	0.04	0.04	0.01	-0.10 *	0.04	-0.05	-0.02	0.02	-0.03
19 External sponsor	0.13	0.33	0	1	0.12 *	0.04	0.09 *	-0.02	0.01	0.03	-0.03	-0.02	-0.03
20 Average relationship length with supporters	11.61	10.57	0	54.50	0.03	0.58 *	-0.41 *	0.02	-0.12 *	0.01	0.09	0.09 *	0.12 *
21 Total business discussions with supporters	26.00	35.45	0	320	0.19 *	0.36 *	0.03	-0.05	0.02	0.08	0.05	-0.14 *	-0.02
22 Teams with more than five supporters	0.08	0.27	0	1	0.70 *	0.23 *	-0.16 *	-0.02	-0.01	-0.01	0.05	-0.01	-0.01

^a Variables 1 - 19 based on n=776; Variables 20 - 22 based on n=487

* p<0.05

Table 2.1: Descriptive Statistics for Founding Team and Support Network Characteristics (Continued)

Variable	10	11	12	13	14	15	16	17	18	19	20	21	22
9 Number of non spousal kin ties (team)													
10 Team age heterogeneity	1.00												
11 Ethnic diversity (team)	0.16 *	1.00											
12 Primary/manufacturing start-up	0.06	-0.03	1.00										
13 Retail/wholesale start-up	0.02	0.06	-0.24 *	1.00									
14 Consumer services start-up	-0.02	0.01	-0.30 *	-0.41 *	1.00								
15 Business services start-up	-0.05	-0.04	-0.25 *	-0.34 *	-0.43 *	1.00							
16 Proportion with start-up experience (team)	0.03	0.08 *	0.07 *	-0.09 *	-0.01	0.03	1.00						
17 Average industry work experience (team)	0.07	0.00	0.26 *	-0.12 *	-0.05	-0.03	0.15 *	1.00					
18 Organizing time (months)	-0.09 *	0.02	0.08 *	-0.04	0.05	-0.09 *	0.03	0.27 *	1.00				
19 External sponsor	0.04	-0.05	-0.07	0.09 *	-0.06	0.02	0.00	-0.07 *	-0.09 *	1.00			
20 Average length of relationship with advisor	0.04	0.00	0.09	0.04	0.01	-0.11 *	-0.03	0.13 *	0.18 *	-0.11 *	1.00		
21 Total business discussion with advisors	-0.08	-0.05	0.09 *	-0.02	-0.04	-0.01	0.13 *	0.02	-0.06	0.06	0.10 *	1.00	
22 Teams with more than five advisors	-0.04	0.04	0.04	-0.06	0.04	-0.02	0.03	0.07	0.09 *	0.03	0.05	0.17 *	1.00

^a Variables 1 - 19 based on n=776; Variables 20 - 22 based on n=487

* p<0.05

Table 2.2: Negative Binomial Regression Models of Support Network Size

	Model 1	Model 2	Model 3
	Total	Kin	Non-Kin
Team size	-0.11	-0.59**	0.01
	[0.09]	[0.17]	[0.10]
Team age heterogeneity	-0.03*	0.01	-0.01
	[0.02]	[0.02]	[0.02]
Number of non spousal kin ties	0.12*	0.36**	0.02
	[0.07]	[0.09]	[0.07]
Teams with spousal pairs	-0.23	0.29	-0.69**
	[0.20]	[0.23]	[0.15]
Mixed gender team	0.53	0.72*	-0.35
	[0.33]	[0.35]	[0.31]
Mixed race team	-0.47*	-0.49	-0.35
	[0.22]	[0.33]	[0.26]
Primary/mfg/trans start-up	-0.29	-0.24	-0.26
	[0.18]	[0.24]	[0.18]
Retail/wholesale start-up	0.03	0.18	-0.08
	[0.16]	[0.19]	[0.14]
Consumer/support services start-up	0.24	0.15	-0.09
	[0.18]	[0.19]	[0.13]
Proportion with start-up experience	0.18	0.14	0.20
	[0.15]	[0.15]	[0.11]
Average industry work experience	0.01	0.00	0.00
	[0.01]	[0.01]	[0.01]
Organizing time (ln)	0.06	0.02	0.06
	[0.06]	[0.07]	[0.05]
External sponsor	0.72**	0.23	0.34**
	[0.24]	[0.20]	[0.13]
Constant	0.48*	-0.25	-0.11
	[0.22]	[0.33]	[0.23]
α	1.30**	1.32**	0.88**
	0.17	0.23	0.13
-2LL	-1452.74	-682.80	-1028.72
DF	13	13	13
χ^2	51.60	28.95	52.06

^a Robust standard errors in brackets; n=776

one-tailed test for independent variables; two-tailed test for control variables

* p < 0.05

** p < 0.01

Table 2.3: Negative Binomial Regression Models of Total Number of Business Discussion with Supporters

	Model 1	Model 2
Length of relationship with supporters (mean)	0.02** [0.01]	0.00 [0.01]
Number of supporters (total)	0.07* [0.04]	
Number of kin supporters		0.50** [0.07]
Number of non kin supporters		0.14** [0.05]
Team size	0.10 [0.08]	0.13* [0.08]
Number of non spousal kin ties on team	-0.09 [0.08]	-0.14* [0.07]
Teams with spousal pairs	-0.69** [0.15]	-0.49** [0.16]
Primary/Mfg/Trans Start-up	0.36 [0.23]	0.41 [0.21]
Retail/Wholesale Start-up	-0.01 [0.17]	-0.01 [0.15]
Consumer/Support Services Start-up	0.06 [0.17]	0.12 [0.15]
Proportion with start-up experience (team)	0.47** [0.13]	0.39** [0.12]
Average team industry work experience (team)	-0.01 [0.01]	-0.01 [0.01]
Organizing time (ln)	0.00 [0.05]	0.02 [0.05]
External sponsor	0.35* [0.15]	0.37** [0.14]
Teams with more than 5 supporters	-0.13 [0.36]	0.41* [0.17]
Constant	2.47** [0.25]	2.09** [0.25]
α	1.33** 0.09	1.21** 0.09
-2LL	-2024.95	-2002.32
DF	13	14
χ^2	69.96	114.80

^a Robust standard errors in brackets; n=487;

one-tailed test for independent variables; two-tailed test for control variables

* p < 0.05

** p < 0.01

Table 2.4: Piecewise Exponential Models of Support Network Characteristics

	Model 1	Model 2
Venture age:	-5.91**	-5.93**
0 - 12 months	[0.40]	[0.39]
12 - 24 months	-5.11**	-5.13**
	[0.35]	[0.35]
24 - 48 months	-4.87**	-4.89**
	[0.34]	[0.34]
48 months +	-5.27**	-5.29**
	[0.32]	[0.31]
Number of supporters (total)	-0.12**	-0.15**
	[0.04]	[0.05]
Team size	0.12	0.15
	[0.12]	[0.12]
Team age heterogeneity	0.04*	0.05*
	[0.02]	[0.02]
Number of non spousal kin ties (team)	0.11	
	[0.08]	
Number of total kin ties		0.05*
		[0.03]
Teams with spousal pairs	-0.67**	-0.76**
	[0.22]	[0.23]
Number of business discussions	0.01*	0.00*
	[0.00]	[0.00]
Mixed gender team	-0.88*	-0.91*
	[0.46]	[0.46]
Mixed race team	0.35	0.34
	[0.33]	[0.33]
Primary/Mfg/Trans Start-up	-0.16	-0.17
	[0.30]	[0.30]
Retail/Wholesale Start-up	0.16	0.14
	[0.23]	[0.23]
Consumer/Support Services Start-up	-0.01	-0.02
	[0.23]	[0.23]
Proportion with start-up experience	0.13	0.13
	[0.19]	[0.19]
Average team industry work experience	-0.04**	-0.04**
	[0.01]	[0.01]
External sponsor	0.86**	0.85**
	[0.21]	[0.21]
Teams with more than 5 supporters	0.54	0.59
	[0.52]	[0.54]
-2LL (χ^2) DF=19	-467.65 (3983.48)	-466.9 (3987.89)

^a Robust standard errors in brackets; one-tailed test for independent vars; two-tailed test for control vars

* p < 0.05; ** p < 0.01; Spells=2846

Table 3.1: Descriptive Statistics for Human Capital and Knowledge Contributions from Founding Team and Support Network

Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1 Technical/Vocational	0.06	0.23	0	1	1.00																
2 Some college	0.36	0.48	0	1	-0.19	1.00															
3 College graduate	0.24	0.42	0	1	-0.14	-0.42	1.00														
4 Post college	0.14	0.35	0	1	-0.10	-0.31	-0.23	1.00													
5 General work experience	8.89	8.03	0	60	0.04	0.03	-0.07	-0.01	1.00												
6 Managerial experience	8.05	8.19	0	53	-0.03	-0.04	0.03	0.22	-0.12	1.00											
7 Industry work experience	8.18	9.03	0	53	0.03	-0.01	-0.03	0.12	0.17	0.35	1.00										
8 Helped start other bus	0.43	0.50	0	1	0.02	-0.02	0.03	0.12	-0.01	0.27	0.14	1.00									
9 Current business owner ¹	0.21	0.41	0	1	0.01	0.00	-0.08	0.07	0.04	0.12	0.10	0.17	1.00								
10 Current business owner ²	0.11	0.31	0	1	0.00	0.03	0.02	0.02	-0.02	0.01	0.06	0.02	-0.18	1.00							
11 Current business owner ³	0.14	0.35	0	1	-0.04	-0.07	0.10	-0.07	0.02	0.05	0.07	0.12	-0.21	-0.14	1.00						
12 Bus start-up course	0.42	0.49	0	1	0.06	0.05	0.04	0.02	-0.05	0.02	-0.03	0.09	0.00	0.07	-0.01	1.00					
13 Primary/manufacturing	0.15	0.35	0	1	0.00	0.00	-0.13	-0.01	0.04	0.11	0.18	0.05	0.12	-0.03	0.04	-0.06	1.00				
14 Retail/wholesale	0.25	0.44	0	1	-0.04	0.01	0.11	-0.06	0.03	-0.03	-0.12	-0.05	-0.04	0.00	-0.01	0.02	-0.24	1.00			
15 Consumer/support services	0.34	0.47	0	1	0.10	-0.05	-0.03	-0.02	-0.03	-0.02	-0.04	-0.05	0.00	0.02	-0.04	-0.03	-0.29	-0.41	1.00		
16 Professional services	0.27	0.44	0	1	-0.07	0.05	0.03	0.09	-0.02	-0.03	0.02	0.05	-0.06	0.00	0.03	0.06	-0.25	-0.35	-0.43	1.00	
17 New venture age (months)	43.34	55.83	0.36	472	0.02	-0.03	-0.03	0.07	0.09	0.06	0.27	0.04	0.06	0.07	0.03	0.00	0.10	-0.05	0.04	-0.08	
18 External sponsor	0.13	0.34	0	1	0.02	-0.06	0.04	0.01	-0.05	0.01	-0.09	-0.01	0.08	0.02	-0.07	0.07	-0.07	0.09	-0.05	0.02	
19 Team size (net)	0.74	0.95	0	4	-0.01	-0.02	0.06	0.05	-0.07	0.05	-0.04	-0.06	-0.08	-0.05	-0.01	-0.12	0.05	-0.06	-0.01	0.03	
20 Support network size (total)	2.07	4.31	0	50	-0.03	-0.05	0.06	0.02	-0.05	-0.02	-0.01	0.04	0.01	0.04	0.02	0.05	-0.07	0.00	0.07	-0.02	
21 Teams >5 supporters	0.05	0.22	0	1	-0.04	-0.02	0.00	0.03	-0.01	0.02	0.04	0.02	0.02	0.01	0.05	0.04	-0.02	-0.03	0.05	-0.01	
					¹ Not working for anyone else; ² Working for others less than 35 hours/week; ³ Working for others 35 hours/week or more					* p<0.05 (in bold)											
					17	18	19	20	21												
17 New venture age (months)					1.00																
18 External sponsor					-0.08	1.00															
19 Team size (net)					-0.09	-0.02	1.00														
20 Support network size (total)					0.04	0.12	-0.06	1.00													
21 Teams >5 supporters					0.07	0.05	-0.05	0.70	1.00												
Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
<i>Team Members Contributions & Relationships (n=379)</i>																					
22 Information/advice	1.19	0.85	0	4	-0.07	0.02	0.06	0.14	-0.09	-0.01	0.02	0.02	-0.10	-0.02	0.09	-0.01	0.04	-0.09	-0.05	0.11	
23 Business training	0.71	0.76	0	4	0.02	0.03	0.06	0.01	-0.07	-0.01	0.03	0.04	-0.03	0.03	0.07	0.06	-0.04	-0.06	-0.04	0.14	
24 Business services	0.60	0.70	0	4	0.01	-0.04	0.13	0.07	-0.01	0.05	0.11	0.09	0.00	-0.02	0.11	0.01	-0.01	-0.02	-0.05	0.08	
25 Start-up experience	0.70	0.82	0	4	-0.04	-0.08	0.15	0.06	-0.08	0.18	0.11	0.26	-0.06	-0.06	0.11	-0.06	0.02	-0.05	-0.04	0.08	
26 Industry experience	7.54	7.05	0	37	0.04	-0.05	0.01	0.12	0.01	0.41	0.75	0.12	0.13	-0.01	-0.01	-0.06	0.25	-0.12	-0.07	-0.02	
27 Team member (spouse)	0.53	0.50	0	2	0.03	0.07	-0.10	-0.05	0.19	0.01	0.03	-0.05	0.08	0.02	0.03	-0.01	-0.01	0.02	0.07	-0.08	
28 Team member (family)	0.25	0.63	0	4	-0.06	0.00	0.08	-0.01	-0.03	-0.10	-0.10	-0.07	-0.01	-0.03	0.03	-0.01	-0.02	-0.01	0.02	0.01	
29 Team member (bus assoc)	0.25	0.61	0	4	0.03	-0.02	-0.01	0.18	-0.11	0.19	0.17	0.12	-0.06	0.07	0.02	0.03	0.05	-0.10	-0.05	0.11	
30 Team member (friend)	0.34	0.72	0	4	0.00	0.02	-0.03	0.06	-0.06	-0.06	-0.02	-0.01	-0.07	-0.07	0.01	0.01	0.03	-0.05	-0.05	0.09	
31 Team member (stranger)	0.09	0.46	0	4	-0.05	-0.09	0.20	-0.01	-0.08	0.03	0.01	0.06	-0.08	0.01	-0.01	-0.13	-0.04	0.04	-0.14	0.15	

Table 3.1: Descriptive Statistics for Human Capital and Knowledge Contributions (Continued)

					17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
22	Information/advice				-0.01	-0.01	0.84	0.04	0.04	1.00												
23	Business training				0.00	0.03	0.54	0.04	0.04	0.58	1.00											
24	Business services				-0.02	0.02	0.42	0.05	0.04	0.40	0.39	1.00										
25	Start-up experience				-0.03	0.06	0.59	0.05	0.06	0.48	0.44	0.36	1.00									
26	Industry experience (avg)				0.18	0.04	0.06	0.00	0.05	0.08	0.14	0.12	0.18	1.00								
27	Team member (spouse)				0.15	0.02	-0.26	-0.02	0.02	-0.27	-0.23	-0.11	-0.23	-0.10	1.00							
28	Team member (family)				-0.01	-0.03	0.41	0.06	0.04	0.33	0.24	0.20	0.20	-0.01	-0.21	1.00						
29	Team member (bus assoc)				-0.02	0.05	0.33	0.01	-0.06	0.31	0.26	0.10	0.26	0.20	-0.40	-0.15	1.00					
30	Team member (friend)				-0.11	0.01	0.48	0.05	0.04	0.43	0.17	0.25	0.23	-0.01	-0.36	-0.06	-0.09	1.00				
31	Team member (stranger)				-0.04	0.00	0.41	0.01	0.02	0.32	0.31	0.15	0.39	-0.01	-0.15	-0.07	0.10	-0.05	1.00			
	Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
	<i>Advisor Contributions & Relationships (n=478)</i>																					
32	Information/advice	2.20	1.35	0	5	0.01	-0.03	0.03	0.05	0.00	0.04	-0.03	0.11	-0.02	0.10	0.07	0.12	-0.09	0.01	0.05	0.01	
33	Business training	1.09	1.16	0	5	0.05	0.01	-0.01	-0.02	0.02	0.00	-0.05	0.07	-0.07	0.13	0.03	0.17	-0.07	0.01	-0.04	0.08	
34	Business services	0.53	0.81	0	5	0.01	0.02	0.04	0.07	0.05	0.14	0.11	0.21	0.02	0.05	0.02	0.08	-0.01	-0.06	0.01	0.06	
35	Start-up experience	1.48	1.22	0	5	0.05	-0.03	0.05	0.01	0.02	0.11	0.04	0.12	-0.04	0.16	0.07	0.11	-0.10	0.05	-0.02	0.05	
36	Supporter (spouse)	0.14	0.35	0	1	-0.03	-0.08	0.05	0.01	-0.07	-0.04	-0.03	0.01	-0.03	-0.04	0.00	-0.05	-0.04	0.04	-0.08	0.09	
37	supporter (family)	0.60	0.95	0	5	-0.02	0.04	-0.08	-0.06	-0.14	-0.02	-0.10	-0.02	0.05	0.03	-0.10	-0.03	-0.04	0.03	0.08	-0.09	
38	Supporter (bus assoc)	0.63	1.05	0	5	0.06	-0.05	0.09	0.02	0.03	0.10	0.05	0.07	-0.02	0.09	0.08	0.07	0.00	0.06	-0.04	-0.01	
39	Supporter (friend)	1.03	1.18	0	5	0.00	0.00	-0.04	0.07	0.09	0.00	0.04	0.06	-0.02	0.04	0.06	0.01	-0.07	-0.05	0.05	0.05	
40	Supporter (teacher)	0.10	0.37	0	3	0.00	-0.05	0.02	0.08	0.06	0.01	0.04	-0.04	-0.10	-0.01	-0.03	0.09	-0.01	-0.07	0.01	0.06	
41	Supporter (stranger)	0.06	0.49	0	5	-0.03	-0.02	0.04	0.05	0.02	-0.06	-0.02	0.13	0.05	-0.04	0.04	-0.02	0.05	-0.07	-0.08	0.12	
						17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
32	Information/advice					0.09	0.08	-0.14	0.47	0.47	-0.10	-0.05	-0.07	-0.09	-0.04	0.04	-0.08	-0.08	0.13	0.17	1.00	
33	Business training					0.06	0.22	-0.10	0.32	0.23	-0.07	0.04	-0.01	-0.09	-0.06	0.00	-0.06	0.00	0.10	0.04	0.58	
34	Business services					0.12	0.07	0.06	0.06	0.14	0.06	0.14	0.16	0.10	0.11	-0.11	0.04	0.10	0.12	0.01	0.33	
35	Start-up experience					0.09	0.09	-0.17	0.47	0.39	-0.15	-0.12	-0.08	-0.04	0.02	0.08	-0.04	-0.05	-0.03	0.17	0.65	
36	Supporter (spouse)					-0.02	0.00	-0.13	0.04	0.06	-0.09	-0.08	-0.08	-0.10	-0.01	-0.27	0.07	-0.08	0.23	-0.05	0.10	
37	Supporter (family)					0.06	-0.02	-0.01	0.24	0.22	-0.01	-0.03	-0.05	-0.01	-0.04	0.14	0.18	-0.21	-0.15	-0.08	0.18	
38	Supporter (bus assoc)					0.00	0.16	-0.01	0.26	0.18	0.00	0.02	0.00	0.03	0.05	-0.02	-0.16	0.33	-0.15	0.19	0.35	
39	Supporter (friend)					0.08	-0.04	-0.06	0.20	0.24	-0.05	-0.03	0.02	-0.07	0.02	-0.09	-0.06	-0.14	0.43	-0.05	0.46	
40	Supporter (teacher)					0.02	-0.06	-0.04	0.06	0.10	-0.05	-0.03	-0.06	-0.05	0.01	0.14	-0.02	-0.07	-0.07	0.13	0.15	
41	Supporter (stranger)					0.01	0.00	0.10	-0.04	-0.03	0.06	0.10	-0.02	0.15	-0.01	-0.11	0.05	0.05	-0.06	0.37	-0.06	
						33	34	35	36	37	38	39	41									
33	Business training					1.00																
34	Business services					0.35	1.00															
35	Start-up experience					0.42	0.19	1.00														
36	Supporter (spouse)					0.06	0.10	-0.01	1.00													
37	Supporter (family)					0.06	0.11	0.08	0.03	1.00												
38	Supporter (bus assoc)					0.32	0.19	0.40	-0.12	-0.22	1.00											
39	Supporter (friend)					0.18	0.03	0.29	-0.08	-0.24	-0.21	1.00										
40	Supporter (teacher)					0.15	-0.02	0.08	0.02	-0.08	-0.03	-0.07										
41	Supporter (stranger)					-0.06	-0.05	-0.03	-0.05	-0.07	-0.07	-0.05	1.00									

Table 3.2: Negative Binomial Regression Models of Founding Team and Support Network Size

	Model 1 Net team members	Model 2 Advisory Network Size
Technical/Vocational	0.33 [0.20]	-0.44 [0.29]
Some college	0.30* [0.13]	-0.12 [0.19]
College graduate	0.48** [0.14]	0.21 [0.23]
Post college	0.48** [0.18]	0.17 [0.20]
Work experience (Net mgr exp)	-0.01 [0.01]	-0.01* [0.01]
Managerial experience	0.01 [0.01]	-0.01* [0.01]
Industry work experience	-0.01 [0.01]	0.01 [0.01]
Helped start other businesses	-0.17* [0.10]	0.13 [0.13]
Current business owner (Not working for anyone else)	-0.29* [0.13]	0.06 [0.17]
Current business owner (Working for others less than 35 hours/week)	-0.28* [0.15]	0.17 [0.17]
Current business owner (Working for others 35 hours/week or more)	-0.08 [0.17]	0.19 [0.17]
Completed business start-up course	-0.33** [0.10]	0.17 [0.12]
Primary/mfg/trans start-up	0.18 [0.15]	-0.17 [0.18]
Retail/wholesale start-up	-0.22 [0.14]	0.03 [0.14]
Consumer/support services start-up	-0.07 [0.13]	0.38* [0.16]
External sponsor	-0.04 [0.14]	0.64** [0.21]
New venture age (ln)	-0.03 [0.04]	0.06 [0.05]
Net team members		-0.13* [0.07]
Constant	-0.12 [0.19]	0.32 [0.25]
-2LL (DF) [χ^2]	-893.58 (17) [44.74]	-1483.62 (18) [42.34]

^a Robust standard errors in brackets; n=792

* p < 0.05 ** p < 0.01; one-tailed test for independent variables; two-tailed test for control variables

Table 3.3: Logistic Regression Models of Knowledge Contributions by Founding Team and Support Network

	General Knowledge				Specialized Knowledge			
	1a	1b [†]	2a	2b	3a	3b	4a	4b
<i>"a": Team Members</i>								
<i>"b": Support Network</i>	Information & advice		Business training		Business services		Start-up experience	
Technical/Vocational	-0.41	-0.49	0.36	-0.3	0.73	0.27	-0.41	0.01
	[0.50]	[0.69]	[0.44]	[0.39]	[0.51]	[0.47]	[0.50]	[0.35]
Some college	0.33	0.06	0.13	-0.18	0.37	0.56*	-0.56*	0.07
	[0.38]	[0.33]	[0.30]	[0.25]	[0.30]	[0.32]	[0.34]	[0.23]
College graduate	0.51	0.25	0.04	-0.46*	0.85**	0.62*	-0.09	0.15
	[0.42]	[0.40]	[0.34]	[0.26]	[0.32]	[0.32]	[0.37]	[0.25]
Post college	0.50	0.09	-0.27	-0.48*	0.54	0.52	-0.95*	-0.3
	[0.57]	[0.39]	[0.39]	[0.28]	[0.37]	[0.36]	[0.46]	[0.28]
Work experience (Net mgr exp)	-0.01	0.01	-0.01	0.01	0	0.02	0	0.01
	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]
Managerial experience	-0.03*	0.00	-0.01	0	-0.01	0.01	0.03*	0.02*
	[0.02]	[0.02]	[0.02]	[0.01]	[0.02]	[0.01]	[0.02]	[0.01]
Industry work experience	0.00	-0.03*	0	-0.01	0.03*	0.01	0.01	0
	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]	[0.01]
Helped start other businesses	-0.01	0.42	-0.07	0.18	0.19	0.69**	1.25**	0.27
	[0.32]	[0.28]	[0.23]	[0.17]	[0.23]	[0.18]	[0.24]	[0.17]
Current business owner (Not working for anyone else)	0.21	0.26	0.47*	-0.22	0.38	-0.07	-0.3	-0.11
	[0.38]	[0.34]	[0.27]	[0.22]	[0.28]	[0.24]	[0.32]	[0.22]
Current business owner (Working for others less than 35 hours/week)	0.27	0.04	0.38	0.26	0.02	-0.04	-0.5	0.35
	[0.42]	[0.33]	[0.33]	[0.25]	[0.33]	[0.25]	[0.34]	[0.24]
Current business owner (Working for others 35 hours/week or more)	0.43	0.58	0.48	-0.02	0.51*	-0.12	-0.03	0.12
	[0.41]	[0.44]	[0.32]	[0.22]	[0.29]	[0.26]	[0.32]	[0.23]
Completed business start-up course	0.14	0.58*	0.43*	0.46**	0.09	0.2	-0.05	0.09
	[0.26]	[0.25]	[0.22]	[0.16]	[0.21]	[0.18]	[0.22]	[0.16]
Team member: Family	0.01		-0.85*		0.19		-0.75	
	[0.62]		[0.42]		[0.43]		[0.56]	
Team member: Business associate	1.18*		-0.12		0.03		0.04	
	[0.64]		[0.46]		[0.45]		[0.60]	
Team member: Friend/acquaintance	0.44		-1.07*		0.18		-0.45	
	[0.59]		[0.45]		[0.44]		[0.58]	

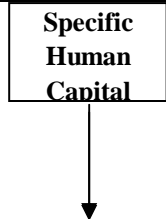
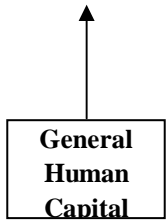


Table 3.3: Logistic Regression Models of Knowledge Contributions by Founding Team and Support Network (Continued)

<i>"a": Team Members</i>	1a	1b	2a	2b	3a	3b	4a	4b
<i>"b": Support Network</i>	Information & advice		Business training		Business services		Start-up experience	
Supporter: Family		-0.25 [0.28]		0.5 [0.85]		1.52 [1.19]		-0.33 [0.73]
Supporter: Business associate		-0.30 [0.26]		0.95 [0.85]		1.35 [1.22]		0.64 [0.74]
Supporter: Friend/acquaintance				0.66 [0.85]		0.96 [1.16]		0.17 [0.72]
Supporter: Teacher/counselor		0.89 [0.79]		1.88* [0.97]		1.19 [1.23]		1.37 [0.84]
Primary/mfg/trans start-up	0.61 [0.48]	0.56 [0.37]	-0.26 [0.34]	-0.1 [0.31]	0.01 [0.31]	0.01 [0.31]	0.38 [0.34]	-0.1 [0.26]
Retail/wholesale start-up	0.35 [0.33]	0.17 [0.30]	-0.05 [0.26]	-0.36 [0.20]	0.14 [0.28]	-0.35 [0.25]	0.28 [0.31]	0 [0.20]
Consumer/support services start-up	0.54 [0.34]	0.59* [0.29]	0.02 [0.26]	-0.33 [0.19]	0.17 [0.27]	-0.04 [0.22]	0.44 [0.27]	-0.05 [0.22]
External sponsor	-0.21 [0.31]	0.53 [0.43]	0.19 [0.30]	0.92** [0.22]	0.04 [0.35]	0.44 [0.25]	0.47 [0.31]	0.13 [0.23]
New venture age (ln)	0.31* [0.15]	-0.01 [0.11]	0.13 [0.11]	0.08 [0.07]	-0.03 [0.11]	0.13 [0.09]	-0.19 [0.12]	0 [0.07]
Net team members	-0.07 [0.13]	-0.17 [0.14]	-0.06 [0.10]	0 [0.09]	-0.16 [0.09]	0.23** [0.08]	0.17 [0.11]	-0.18* [0.09]
Support network size		-0.02 [0.02]		0.03* [0.01]		-0.09** [0.03]		0.05* [0.02]
Teams with more than 5 supporters		0.36 [0.43]		-0.59 [0.31]		0.65 [0.39]		-0.34 [0.33]
Constant	0.11 [0.76]	1.60** [0.57]	0.28 [0.61]	-1.27 [0.91]	-0.99 [0.61]	-4.01** [1.28]	0.11 [0.73]	-0.14 [0.79]
Observations	541	1190	542	1188	542	1190	531	1115
-2LL	-237.55	-396.06	-359.52	-763.9	-355.91	-574.6	-321.7	-685.07
DF [χ^2]	21[19.89]	23[40.37]	21[28.36]	24[69.90]	21[22.51]	24[65.99]	21[65.24]	24[60.32]

^a Robust standard errors in brackets; one-tailed test for independent variables; two-tailed test for control variables; †Reference category is Friends/Acquaintance

* p < 0.05 ** p < 0.01

Table 3.4: Piecewise Exponential Models of Organizational Knowledge Characteristics

	Models	1	2	3	4
<i>Venture age:</i>		-6.21**	-6.27**	-6.20**	-5.49**
0 - 12 months		[0.29]	[0.29]	[0.29]	[0.34]
12 - 24 months		-4.94**	-4.99**	-4.94**	-4.21**
		[0.19]	[0.20]	[0.20]	[0.26]
24 - 48 months		-4.78**	-4.82**	-4.77**	-3.96**
		[0.17]	[0.17]	[0.17]	[0.25]
48 months +		-5.30**	-5.33**	-5.28**	-4.34**
		[0.18]	[0.17]	[0.18]	[0.27]
Team members provided information or advice		-0.23*		-0.24*	-0.33**
		[0.12]		[0.13]	[0.12]
Team members provided business training		0.12		0.12	0.17
		[0.15]		[0.15]	[0.14]
Team members provided business services		-0.50**		-0.46**	-0.43**
		[0.14]		[0.14]	[0.14]
Team members have start-up experience		0.11		0.13	0.13
		[0.11]		[0.11]	[0.12]
Supporters provided information or advice			0.03	0.04	0.04
			[0.08]	[0.08]	[0.09]
Supporters provided business training			0.12	0.1	0.1
			[0.08]	[0.09]	[0.09]
Supporters provided business services			-0.24*	-0.20*	-0.14
			[0.10]	[0.11]	[0.11]
Supporters have start-up experience			-0.08	-0.09	-0.03
			[0.09]	[0.09]	[0.09]
Technical/Vocational					-0.57
					[0.38]
Some college					-0.02
					[0.18]
College graduate					-0.18
					[0.21]
Post college					-0.03
					[0.23]
Work experience (Net mgr exp)					0
					[0.01]
Managerial experience					0.01
					[0.01]

Table 3.4: Piecewise Exponential Models of Rate of Quitting on Organizational Knowledge Characteristics

	Models	1	2	3	4
Helped start other businesses					-0.2 [0.14]
Current business owner (Not working for anyone else)					-0.85** [0.18]
Current business owner (Working for others less than 35 hours/week)					-1.21** [0.26]
Current business owner (Working for others 35 hours/week or more)					-0.86** [0.22]
Completed business start-up course					-0.34* [0.13]
Average team industry work experience					-0.03** [0.01]
Primary/mfg/trans start-up		-0.26 [0.21]	-0.25 [0.21]	-0.26 [0.21]	0 [0.22]
Retail/wholesale start-up		0.16 [0.16]	0.14 [0.17]	0.15 [0.16]	-0.01 [0.18]
Consumer/support services start-up		-0.05 [0.17]	-0.05 [0.17]	-0.03 [0.17]	0.02 [0.17]
External sponsor		0.67** [0.15]	0.64** [0.16]	0.67** [0.15]	0.75** [0.15]
Number of net new team members		0.42** [0.08]	0.23** [0.06]	0.42** [0.08]	0.40** [0.09]
Support network size		-0.05 [0.03]	-0.04 [0.04]	-0.05 [0.04]	-0.06 [0.06]
Teams with more than 5 supporters		0.02 [0.46]	0.13 [0.41]	0.08 [0.44]	0.16 [0.54]
Observations		3703	3703	3703	3703
-2LL		-721.66	-729.17	-718.73	-666.47
DF		15	15	19	31
χ^2		6907.39	6726.17	6976.36	6817.17

^a Robust standard errors in brackets; one-tailed test for independent variables; two-tailed test for control variables

* p < 0.05

** p < 0.01

Table 4.1: Descriptive Statistics of Latent Variables and Observed Indicators

		(N=807)	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Goal Orientation (η_1)																			
1	y ₁	Developed product/service	0.82	0.38	1.00														
2	y ₂	Started marketing of product/service	0.88	0.33	0.39 *	1.00													
3	y ₃	Created financial projections	0.76	0.43	0.25 *	0.21 *	1.00												
Boundedness (η_2)																			
4	y ₄	Filed Federal income tax return	0.68	0.47	0.45 *	0.35 *	0.39 *	1.00											
5	y ₅	Opened bank account	0.75	0.43	0.37 *	0.34 *	0.37 *	0.58 *	1.00										
6	y ₆	Established supplier credit	0.70	0.46	0.32 *	0.24 *	0.36 *	0.38 *	0.42 *	1.00									
Inter-organizational Exchange (η_3)																			
7	y ₇	Generated revenues from sale of goods/services	0.84	0.36	0.47 *	0.47 *	0.34 *	0.48 *	0.45 *	0.33 *	1.00								
8	y ₈	Purchased, leased, rented equipment, facilities, property	0.84	0.37	0.32 *	0.36 *	0.31 *	0.40 *	0.44 *	0.34 *	0.42 *	1.00							
9	y ₉	Purchased raw materials, inventory, supplies, components	0.92	0.27	0.31 *	0.39 *	0.22 *	0.30 *	0.30 *	0.25 *	0.41 *	0.39 *	1.00						
Industrial Sector																			
10		Manufacturing/Trans/Primary	0.14	0.35	0.04 *	-0.02	0.06 *	0.07 *	0.05 *	0.11 *	0.01	0.06 *	0.03 *	1.00					
11		Retail/Wholesale	0.25	0.43	0.06 *	0.05 *	-0.01	-0.01	0.03 *	0.11 *	0.04 *	-0.01	0.05 *	-0.24 *	1.00				
12		Consumer/Support Services	0.34	0.47	-0.04 *	-0.01	-0.01	-0.02	0.00	-0.03	-0.01	0.00	-0.06 *	-0.30 *	-0.42 *	1.00			
13		Professional Services	0.26	0.44	-0.05 *	-0.02	-0.02	-0.03	-0.08 *	-0.16 *	-0.03 *	-0.04 *	-0.02	-0.25 *	-0.35 *	-0.43 *	1.00		
14		Organizing Time (Months)	43.30	55.47	0.02	0.00	-0.09 *	0.03 *	-0.04 *	0.01	0.04 *	0.06 *	0.04 *	0.10 *	-0.05 *	0.04 *	-0.08 *	1.00	
		Min	0.36	.															
		Max	472.21																

* p<0.05

Table 4.2: Organizational Emergence Model Fit Statistics

Fit Statistics	Model 1	Model 2
Correlation Residuals (Mean)	-0.01	
Primary/Manufacturing/Transportation		-0.01
Retail/Wholesale		-0.02
Consumer/Support Services		-0.01
Professional Services		-0.01
CFI	0.99	0.99
TLI	0.99	0.99
1-RMSEA	0.96	0.96
χ^2 Value	54.16	87.51
Degrees of Freedom	23	64
P-Value	0.00	0.03

Model 1: Overall Model

Model 2: Multiple Group Analysis -

Thresholds and Loadings Free Across Groups

Table 4.3: Factor Loadings, Component Fit Statistics, and Predicted Probabilities – Overall Model

	β	λ	S.E.	$\beta*\lambda$	R^2	θ	τ	$\eta_4 = (-\sigma)$	Pr($y_j=1$) when		Δ in	% Δ
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	$\eta_4=0$	$\eta_4=(\sigma)$	(11=10-8)	(12)
Goal Orientation	1.00		0.00									
y_1 Developed product/service		1.00	0.00	1.00	0.59	0.41	-0.88	0.55	0.91	1.00	0.45	80.9%
y_2 Started marketing of product/service		1.03	0.07	1.03	0.59	0.41	-1.11	0.67	0.96	1.00	0.33	48.3%
y_3 Created financial projections		0.87	0.07	0.87	0.45	0.55	-0.90	0.61	0.89	0.98	0.37	61.0%
Boundedness	1.07		0.065									
y_4 Filed Federal income tax return		1.00	0.00	1.07	0.83	0.17	-0.27	0.08	0.75	1.00	0.92	1131.4%
y_5 Opened bank account		0.98	0.04	1.05	0.79	0.21	-0.65	0.35	0.92	1.00	0.65	188.6%
y_6 Established supplier credit		0.79	0.056	0.84	0.51	0.49	-0.44	0.37	0.74	0.94	0.57	153.5%
Inter-organizational Exchange	1.13		0.065									
y_7 Generated revenues from sale of goods/services		1.00	0.00	1.13	0.82	0.19	-0.66	0.29	0.94	1.00	0.71	239.3%
y_8 Purchased, leased, rented equipment, facilities, property		0.89	0.04	1.00	0.64	0.36	-0.65	0.40	0.86	0.99	0.59	146.4%
y_9 Purchased raw materials, inventory, supplies, components		0.88	0.06	0.99	0.63	0.38	-0.94	0.60	0.94	1.00	0.40	67.3%
Organizing Time (Ln Months)	γ							Operating Status				
Goal Orientation	-0.01		0.04					σ	0.79			
Boundedness	0.04		0.04					σ^2	0.63			
Inter-organizational Exchange	0.14		0.05									

Note: All β , λ coefficients significant at $p < 0.001$. γ_3 significant at $p < 0.05$.

Table 4.4: Change in Predicted Probabilities of Activity Occurrence by Industrial Sectors

	Δ in $\Pr(y_j=1)$				
	Total	Primary/Mfg/ Trans	Professional Services	Retail/ Wholesale	Consumer/ Support Services
Goal Orientation					
Y ₁ Developed product/service	0.45	0.69	0.41	0.00	0.79
Y ₂ Started marketing of product/service	0.33	0.10	0.50	0.00	0.72
Y ₃ Created financial projections	0.37	0.31	0.46	0.33	0.30
Boundedness					
Y ₄ Filed Federal income tax return	0.92	0.97	0.96	0.65	0.95
Y ₅ Opened bank account	0.65	0.61	0.80	0.36	0.62
Y ₆ Established supplier credit	0.57	0.00	0.46	0.55	0.69
Inter-organizational Exchange					
y ₇ Generated revenues from sale of goods/services	0.71	1.00	0.81	0.20	0.78
y ₈ Purchased, leased, rented equipment, facilities, property	0.59	0.34	0.75	0.40	0.65

Note: Calculations based on differences in predicted probabilities for one standard deviation above and below the mean value of organizational emergence

Figure 4.1: Organizational Emergence Model Path Diagram

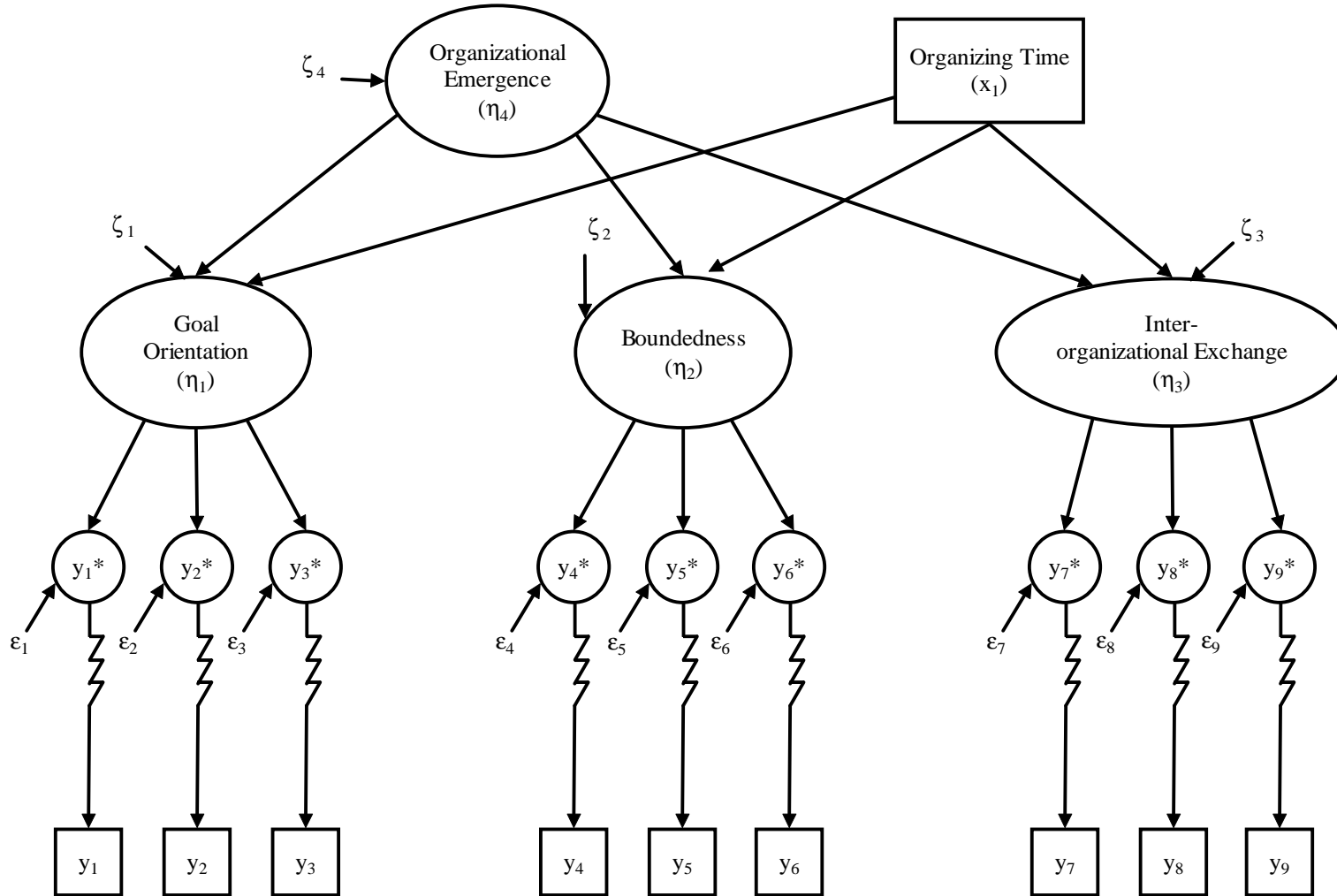
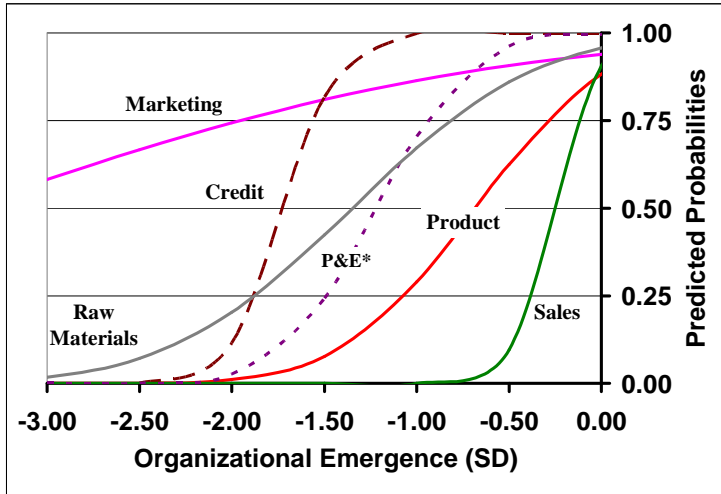
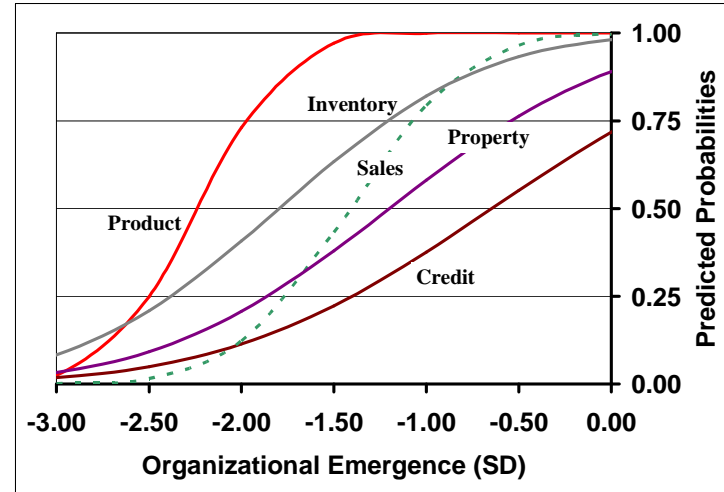


Figure 4.2: Predicted Probabilities of Activity Occurrences by Industrial Sectors

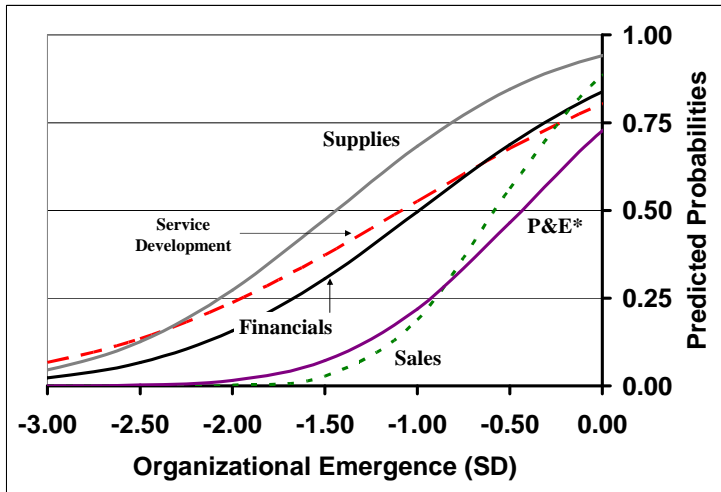
(a) Primary/Manufacturing/Transportation



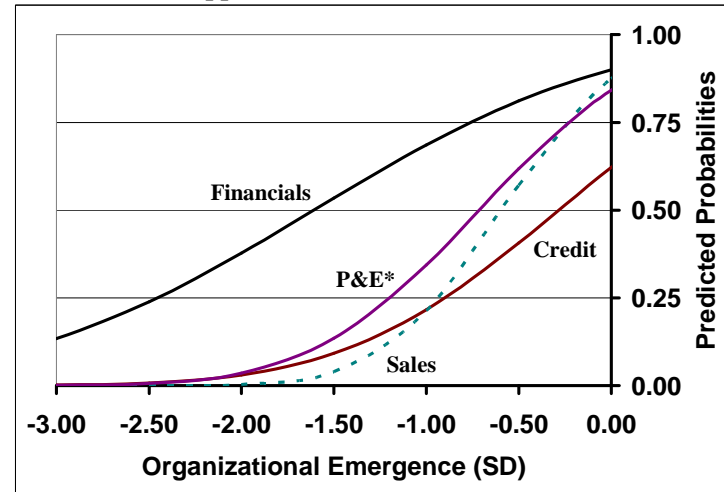
(c) Retail/Wholesale



(b) Professional Services



(d) Consumer/Support Services



*P&E refers to purchased, leased, or rented equipment, facilities, or property.

Note: Organizational emergence ranges from -3σ to μ .

Appendix A: Coding Start-Up Activities

Respondents reported whether 28 start-up activities occurred and the month/year of the occurrence. Details on each activity appear in Gartner et al. (2004b). I constructed a variable, *organizing time*, based on the time between the first qualified start-up activity and the first interview. Several types of inconsistencies exist with these start-up activity reports. I created the following coding rules to address these inconsistencies. First, I designated 25 of the 28 activities as qualified activities for calculating organizing time. I defined organizing time as when a nascent entrepreneur conducts specific and tangible actions towards the creation of a new business. From the organizing time calculation, I excluded when respondents first started thinking about new venture idea and only referred to this date selectively (see below). Survey questions asking when a respondent started taking classes and began saving money to invest were poorly constructed and led to inconsistent reports. I omitted these two activities in organizing time calculations as well.

Second, respondents in new ventures affiliated with an external sponsor, such as a multi-level marketing (MLM) firm or franchisor, may have attributed some start-up activities to their sponsors. To ascertain any questionable reports, I reviewed the start-up activity dates for these 51 cases and used their responses to open-ended questions as cross-validation. Nearly all respondents provided information on their sponsors. I compared the respondents' reported dates with background information of the MLM available through their websites. In 25 cases, the respondents provided information related to their external sponsors. Of these cases, 20 respondents reported the founding date of the MLM as the date when their ventures' product/service was developed and in eight cases, when marketing activities commenced or listing in a phone book occurred. For these cases, I recoded these activity

dates to when the respondents first reported thinking about starting the venture. In five cases, respondents used the MLM founding date to denote when a start-up team formed and patent/copyright/trademark application filed. I recoded the activities as not having occurred and their dates to missing.

Third, after making these changes, I also reviewed the start-up activity dates for the top five percent of cases in terms of organizing time. I recoded dates in 13 cases because of apparent coding errors.

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