ELSEVIER

Journal of Business Venturing 18 (2003) 301–331

JOURNAL of BUSINESS VENTURING

The role of social and human capital among nascent entrepreneurs

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Received 1 January 2000; received in revised form 1 March 2002; accepted 1 March 2002

Abstract

This study examines nascent entrepreneurship by comparing individuals engaged in nascent activities ($n = 380$) with a control group ($n = 608$), after screening a sample from the general population ($n = 30{,}427$). The study then follows the developmental process of nascent entrepreneurs for 18 months. Bridging and bonding social capital, consisting of both strong and weak ties, was a robust predictor for nascent entrepreneurs, as well as for advancing through the start-up process. With regard to outcomes like first sale or showing a profit, only one aspect of social capital, viz. being a member of a business network, had a statistically significant positive effect. The study supports human capital in predicting entry into nascent entrepreneurship, but only weakly for carrying the start-up process towards successful completion.

Keywords: Nascent entrepreneurship; Start-up process; Social capital; Human capital

1. Executive summary

Our knowledge about individuals who navigate various obstacles at the very earliest stages of entrepreneurial activity remains limited. Many people who begin the process of starting a

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0883-9026/02/$ – see front matter
doi:10.1016/S0883-9026(02)00097-6

new business fail to achieve their goal, while others are quite successful. Do individuals who attempt to start businesses begin with different levels of human or social capital? Do these endowments affect their rate of success?

Previous research excludes many of the efforts that eventually result in termination before the emergence of the firm. Therefore, the bulk of research, which comprises much of our knowledge of entrepreneurship, suffers from selection bias, the result of sampling only successful emergent entrepreneurs or enterprises. Further, efforts to examine start-up attempts ex-post suffer from hindsight bias and memory decay.

This study examined nascent entrepreneurship by first comparing individuals engaged in nascent activities ($n = 380$) with a control group of non-entrepreneurs ($n = 608$), both drawn from a sample of the general population ($n = 30{,}427$) of Swedish adults. Within the group of nascent entrepreneurs, we then sought to explain differences in the frequency of gestation activities during an 18-month period, as well as two critical outcomes of successful emergence: first sales and profitability. Our primary objective was to help close a research gap regarding human capital and social capital influences on nascent entrepreneurs. We examined the comparative importance of various contributions and factors, such as personal networks, business networks, contact with designated assistance agencies and taking business classes, on the likelihood of successful emergent activity.

Our findings supported the role of formal education, as well as previous start-up experience, in predicting who among a cross-section of the general population would attempt to engage in any nascent activities. In contrast, formal education did not appear to be a factor in determining success in the exploitation process, neither in terms of the frequency of gestation activities over time nor in predicting those who succeeded with a first sale or a profitable venture. Other human capital measures, such as previous start-up experience and having taken business classes, were predictors of the frequency of gestation activities over time. They were not found to be important in determining the actual first sales or the profitability of the new enterprise, criteria we use to measure successful emergence.

Social capital variables were found to be very strong and consistent predictors in the analysis. We used measures for both bonding and bridging social capital, based on strong and weak ties. Overall, social capital was found to be higher in the nascent group than in the control group. Bonding social capital based on strong ties, such as having parents who owned businesses or close friends who owned businesses, was a good predictor in differentiating those engaged in nascent entrepreneurship from the control population, as was active encouragement from family and friends. Bridging social capital based on weak ties was found to be a strong predictor of rapid and frequent gestation activities, i.e., for carrying the start-up process further. Bridging social capital was also important in determining which of the nascent entrepreneurs would report a first sale or a profit—both conceived of as critical factors that determine successful firm emergence. Being a member of a business network such as a member of the Chamber of Commerce, Rotary or Lions, was significant and strong throughout the analysis. Those who were members of a start-up team were also more likely to have a comparatively rapid pace of gestation activities.

The findings from this study suggest that entrepreneurs would be well advised to develop and promote networks of all sorts, particularly interfirm and intrafirm relations. Given the rapid changes and advances in communication technologies, and the increasing feasibility of entrepreneurs to work in autonomous, distantly separated environments, careful attention toward the promotion and development of social, network and mentoring capabilities would seem prudent.

This research questions the value of many assistance programs provided to nascent entrepreneurs. Contact with agencies may be promoting bureaucratic activities, but failed to predict activities indicative of successful emergence, such as a first sale, profit or even the speed with which the gestation activities occurred. Taking business classes was associated with increased activities, but failed to predict who had a first sale or who became profitable. Our research suggests that current efforts to promote entrepreneurial development may be missing the mark. A plausible interpretation of our overall results is that the further into the start-up process one gets, the more specific and idiosyncratic will be the resources and information needed for further successful completion of the process. National and regional governments considering intervention activities might be advised to focus on structural relationships rather than on programs specifically targeted to promote certain entrepreneurial activities, which may not be the most relevant in many individual cases. For example, they might be advised to develop business centers that focus on the facilitation of community and networking activities, thereby increasing each nascent entrepreneur's probability of finding the idiosyncratic inputs s/he needs.

2. Introduction

Contemporary definitions of entrepreneurship or delineations of entrepreneurship research focus on *emergence* (Gartner, 1988; Shane and Venkataraman, 2000). The suggestion is that entrepreneurship research should deal with early stage phenomena, such as how opportunities are detected and acted upon, or how new organizations come into being. Shane and Venkataraman (2000) emphasize that entrepreneurship consists of two related processes, *discovery* of entrepreneurial opportunities and *exploitation*[3] of such opportunities. We adopt this perspective in the present research.

Given the suggested focus on emergence, it is somewhat ironic that published entrepreneurship research is dominated by studies based on samples of existing business firms (Davidsson and Wiklund, 2001). Studies that include the earliest, prefirm stages are rare (although not completely nonexistent, cf. Carter et al., 1996). There does exist a nonnegligible literature on prefirm issues, but this line of research typically focuses on intentions rather than behavior, and uses samples of individuals who have not yet entered into nascent entrepreneurial activity (e.g., Bird and Jelinek, 1988; Davidsson, 1995; Krueger and Brazeal, 1994; Krueger

[3] Note that, this as used here, the term "exploitation" should not be associated with the negative connotations it might have in other contexts. "Exploitation" here refers to an opportunity being acted upon rather than merely contemplated.

and Carsrud, 1993). The major limitation of this approach is the question of the intention–behavior relationship, a relationship that has been shown to be weak in many cases (Foxall, 1984).

Therefore, despite the avowed importance of entrepreneurship to the economic system, it can be argued that our empirically based knowledge about entrepreneurship understood as emergence is still very limited (Ripsas, 1998; Wennekers and Thurik, 1999). For example, we know little of the specific social processes that may enhance the ability to recognize or exploit opportunities. Does formal education increase an entrepreneur's cognitive abilities to better evaluate opportunities, as asserted by Schultz (1959)? Are memberships in social networks a potential source of scarce information leading to opportunity recognition; are they facilitators of resource acquisition, or perhaps a location of knowledge diffusion leading to increased competition? How do various forms of educational and social resources differentially contribute to the dynamic processes of opportunity recognition and exploitation?

The purpose of our research is to provide methodologically sound empirical longitudinal observations leading to a better understanding of aspects of human and social capital that may be influential during the emergent phases of the entrepreneurial process. We believe that this study will further our theoretical understanding of the dynamic processes involved in entrepreneurial opportunity recognition and exploitation, by comparing and testing theoretical assumptions previously unmeasured for nascent entrepreneurs. We also expect that aspects of our findings will assist entrepreneurs and those who counsel them in their ability to successfully engage in entrepreneurial processes.

Our approach to studying nascent entrepreneurship is to overcome methodological problems introduced by hindsight bias and memory decay resulting from retrospective study. We identify a random sample of nascent entrepreneurs or start-up efforts from the general population at a very early stage. By so doing, we can also include those efforts that fail or are abandoned at early stages, as well as providing a control sample from the general population of non-nascent entrepreneurs. Our design excludes mere intentions, where no concrete steps towards starting a business have been taken, and it also excludes firms that are already up and running. Hence, we focus on the sample that is in the process of business emergence.

Our objective is to analyze and map various theoretical components of human and social capital to both of the subprocesses suggested by Shane and Venkataraman (2000), discovery and exploitation. To study issues related to *discovery* is one of the most important and at the same time most difficult challenges for entrepreneurship research, especially if real time study is required in order to avoid success bias. Entrepreneurial discovery (or opportunity recognition) is likely to be infrequent and therefore difficult and costly to capture in real time. Further, there is no way to know or sample from the universe of not-yet-discovered entrepreneurial opportunities. We have chosen to investigate the influence of human and social capital on discovery in an indirect manner. More specifically, we compare different theoretical components of human and social capital of nascent entrepreneurs with those of a control group, i.e., we compare a group of people who have made what they perceive to be discoveries that are worthwhile to pursue with a group who currently has not done so. If the

groups differ on human and social capital factors that are theoretically claimed to assist with entrepreneurial discovery we will infer that the group differences represent causal effects.

In order to study *exploitation*, we follow the sample of nascent entrepreneurs over time and examine various theoretical human and social capital influences over time, on the outcomes of the process. Our measurements include both the exploitation effort and the exploitation outcome over time. We are aware of no other study that utilizes such a framework.

The paper proceeds as follows: in Section 3, we review theory and previous research on human and social capital. This leads to the generation of six hypotheses to be tested. We then describe the methods we have used for data collection and analysis. Following that, we present the results of our analysis. The paper concludes with Section 6, where we interpret our results and state their implications.

3. Theory

3.1. Human capital and the entrepreneur

Human capital theory maintains that knowledge provides individuals with increases in their cognitive abilities, leading to more productive and efficient potential activity (Schultz, 1959; Becker, 1964; Mincer, 1974). Therefore, if profitable opportunities for new economic activity exist, individuals with more or higher quality human capital should be better at perceiving them. Once engaged in the entrepreneurial process, such individuals should also have superior ability in successfully exploiting opportunities. One weakness in the theory is that it essentially takes a black box view of educational production and accumulation activities at equilibrium. Although the theory assumes that more human capital is always better, social systems may bias individuals to either over-invest or under utilize their investment. Further, the amount previously invested in human capital may influence life career choices, including attitudes towards entrepreneurial activity, in various ways. For example, over-investment leading to high levels of certification may discourage risk taking, while under-investment may encourage it. For this reason, migrants are frequently engaged in entrepreneurial activities—they reside in a new social structure that may not reward their formal human capital investments. In our study, we are concerned with the implications of accumulated knowledge and how it affects agents who might or might not be nascent entrepreneurs. Although we do not attempt to ascertain levels of absolute knowledge or propensity towards risk taking, we examine a range of formal and nonformal human capital activities that may lead to knowledge promotion. We examine these factors to observe entrepreneurial outcomes for both nascent entrepreneurs and the general population and, in terms of performance, for nascent entrepreneurs alone. Because we utilize a longitudinal study, we can begin to examine what types of human capital promote, or fail to facilitate the discovery and exploitation processes for these two population groups. We believe this approach to be unique.

Previous knowledge plays a critical role in intellectual performance. It assists in the integration and accumulation of new knowledge, as well as integrating and adapting to new situations (Weick, 1996). Knowledge may be defined as being either tacit or explicit (Polanyi, 1967). Tacit knowledge refers to know-how, the often noncodified components of activity. Know-what consists of the explicit type of information normally conveyed in procedures, processes, formal written documents and educational institutions. Solving complex problems and making entrepreneurial decisions utilizes an interaction of both tacit and explicit knowledge, as well as social structures and belief systems. Thus, individuals may be able to increase their knowledge as a result of formal education, such as university education, informal education, such as work experience and nonformal education, such as adult education.

Formal education is one component of human capital that may assist in the accumulation of explicit knowledge that may provide skills useful to entrepreneurs. Empirical research has demonstrated a range of results regarding the relationship between education, entrepreneurship and success, with education frequently producing nonlinear effects in supporting the probability of becoming an entrepreneur, or in achieving success (Bellu et al., 1990; Davidsson, 1995; Evans and Leighton, 1989; Gimeno et al., 1997; Honig, 1996; Reynolds, 1997). A number of studies have found that, for men, returns to education are conditional on both the industry and higher levels of education, such as college or graduate studies (Bates, 1995; Honig, 1998). For female entrepreneurs, education seems to be particularly important (Bates, 1995).

Human capital is not only the result of formal education, but includes experience and practical learning that takes place on the job, as well as nonformal education, such as specific training courses that are not a part of traditional formal educational structures. Thus, broad labor market experience, as well as specific vocationally oriented experience, is theoretically predicted to increase human capital (Becker, 1964). Although empirical results have been mixed (cf. Davidsson, 1989, pp. 37–38), there are studies showing labor market experience, management experience, and previous entrepreneurial experience as significantly related to entrepreneurial activity, particularly when controlling for factors such as industry and gender (Bates, 1995; Gimeno et al., 1997; Robinson and Sexton, 1994).

In all, previous research tends to support the existence of a positive relationship between human capital and entrepreneurial activity. However, studies examining this relationship have not yielded consistently strong results. Conflicting findings are easily found. Research suggests that the relationship between human capital and entrepreneurial activity may be confounded by a number of factors. For example, it has been demonstrated that the relationship between persistence and education is nonlinear, with human capital increasing performance, but not persistence (Gimeno et al., 1997). In addition, different types of human capital may be more important at different stages of the entrepreneurial process. Unfortunately, much of the available research only examines the latter stages of entrepreneurial development (Preisendorfer and Voss, 1990). A frequent further limitation is that few studies have attempted to incorporate extensive measures of social structure, factors that may amplify or mitigate human capital outcomes (see, e.g., Bates, 1995; Bruderl and Preisendorfer, 1998; Preisendorfer and Voss, 1990; Robinson and Sexton, 1994). We discuss the implications of social capital in Section 3.2.

Thus, although we predict that knowledge is critical to both the discovery and exploitation of entrepreneurial opportunities, previous research gives only very imprecise understanding of what types of learning experiences will be helpful at what stages of entrepreneurial processes. In particular, the lack of a control population constrains our understanding of how and what types of knowledge are utilized. In this research, we examine both the control and the nascent entrepreneur populations on a range of four different aspects of human capital, viz. years of education, years of work experience, years experience as a manager and whether or not an individual has previous start-up experience, as independent variables. We add having taken business classes as an independent human capital variable for our nascent entrepreneurs, longitudinally. We regard these measures as indicators of human capital representing both tacit knowledge, gained through experience and explicit knowledge, gained through formal education. We do not make a priori assumptions as to the relative influence of tacit and explicit knowledge at various stages of the process, expecting to inductively infer if, how and when each is most relevant. The following hypotheses regarding the role of human capital are proposed:

Hypothesis 1: Human capital, representing tacit and explicit knowledge, will be positively associated with entrepreneurial discovery, as indicated by the probability of entering into nascent entrepreneurial activities.

Hypothesis 2: Human capital, representing tacit and explicit knowledge, will be positively associated with successful exploitation in terms of being able to make the process move forward, as indicated by the frequency and pace by which nascent entrepreneurial activities are completed.

Hypothesis 3: Human capital, representing tacit and explicit knowledge, will be positively associated with successful exploitation in terms of creating a viable business entity, as indicated by obtaining sales and achieving profitability.

3.2. Social capital and the entrepreneur

Social capital theory refers to the ability of actors to extract benefits from their social structures, networks and memberships (Lin et al., 1981; Portes, 1998). Social networks provided by extended family, community-based, or organizational relationships are theorized to supplement the effects of education, experience and financial capital (Bourdieu, 1983; Coleman, 1988, 1990; Loury, 1987). Social capital is multidimensional, and occurs at both the individual and the organizational levels (Nahapiet and Ghoshal, 1998). Social capital is broadly defined in the literature, such that a precise link between definition and operationalization is necessary in order to explain any aspect of the many network processes and reciprocities characterized under this umbrella term (Baron and Hannan, 1994).

In this study, we broadly utilize social capital in terms of social exchange (Emerson, 1972), to examine the effects of exchange ties on performance. Exchange effects may range from the provision of concrete resources, such as a loan provided by a mother to her daughter, to intangible resources, such as information about the location of a new potential client. We are thus interested in factors related to social relations, as opposed to market or hierarchically

based relations (Adler and Kwon, 2002). These consist of the pattern of particular ties between actors, where variation in the network in the existence or strength of ties is meaningful and consequential (Burt, 2000; Cook and Whitmeyer, 1992, p. 118).

Social capital can be a useful resource both by enhancing internal organizational trust through the bonding of actors, as well as by bridging external networks in order to provide resources (Adler and Kwon, 2002; Putnam, 2000). A major factor enhancing the strength of social capital consists of trust, often a result of obligations, threat of censure and exchange (Coleman, 1988; Granovetter, 1985). This trust forms a bonding (or exclusive) glue that holds closely knit organizations together. A second aspect of social capital consists of ties that provide resources such as information, providing a bridging (inclusive) lubricant (Putnam, 2000). Ties that result in social capital can occur at both individual and organizational levels, although they are frequently attributed primarily to the individual agents involved. These ties may be either direct or indirect, their intensity may vary, and the outcomes (in terms of bonding or bridging social capital) contingent on the type of network being analyzed. In Granovetter's (1973) classic work, he highlights the importance of maintaining an extended network of weak ties in obtaining resources (information about potential jobs). Weak ties are loose relationships between individuals, as opposed to the close ties that would be found in a nuclear family. Weak ties are useful in obtaining information that would otherwise be unavailable or costly to locate. They extend one's network by linking individuals or organizations together and providing an interface for exchanges to take place. Nascent firms might, for example, rely upon weak ties such as membership in a trade organization in order to learn about the latest technological innovations. In contrast, an example of strong ties would be a sibling or parent helping out for free in some aspect of the start-up activities. Thus, strong ties, such as those derived from family relationships, provide secure and consistent access to resources. The more personal resources one has, the less likely one is to rely on strong ties and the more attractive weak ties become (Cook and Whitmeyer, 1992). We depict the various components of social and human capital relevant to the nascent entrepreneurial process in Fig. 1.

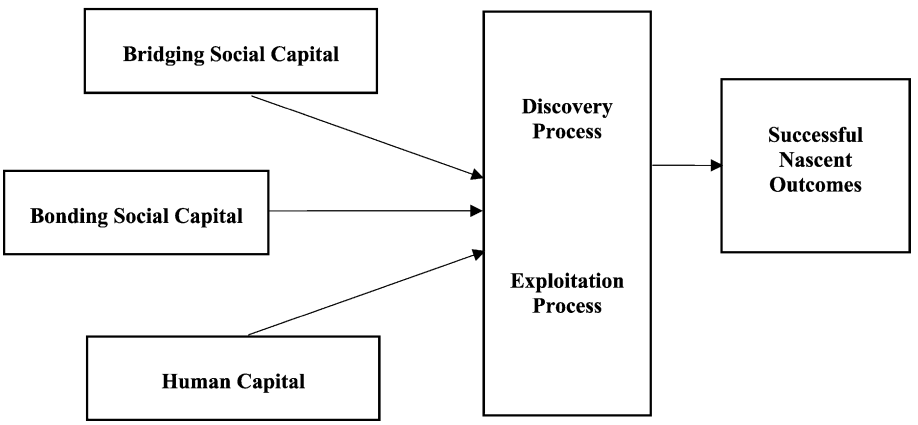

Fig. 1. Social capital, human capital, and the nascent entrepreneur.

Social capital is often operationalized through the identification of networks and network relationships, sometimes defined by the strength of ties, repetitive group activity such as the frequency of meetings and other formal interactions, as well as informal gatherings and other social activities, and social and family relationships. From an entrepreneurial perspective, social capital provides networks that facilitate the discovery of opportunities, as well as the identification, collection and allocation of scarce resources (Birley, 1985; Greene and Brown, 1997; Uzzi, 1999). Social capital may also assist with the entrepreneurial exploitation process, by providing and diffusing critical information and other essential resources.

During the discovery process, social capital assists nascent entrepreneurs as individuals by exposing them to new and different ideas, world views, in effect, providing them with a wider frame of reference both supportive and nurturing to the new potential idea or venture (Aldrich and Zimmer, 1986; Aldrich et al., 1998). Entrepreneurs frequently make decisions as a result of associations based on friendship or advice (Bruderl and Preisendorfer, 1998; Paxton, 1999), often consisting of social capital based on weak ties. Strong ties maintained by entrepreneurs and other team members may also assist in the discovery process. Aldrich et al. (1998) refer to the importance of family socialization by inspiring autonomy, as well as the delivery of personal networks that provide valuable resources. Strong ties within the nascent venture may also yield increased efficiency in resource utilization.

The discovery process is defined by asymmetrical information between entrepreneurs and the owners of resources (Shane and Venkataraman, 2000). Because information is limited, both bridging and bonding social capital may enhance the flow of information. Cooper and Dunkelberg (1986) found that entrepreneurs often start businesses related to their former occupations. Microbusinesses are particularly dependent upon the advice of friends and relatives in order to retain confidentiality as well as personal control (Bennett and Robson, 1999). Ideas, innovations, opportunities, perspectives and normative world views are factors that may yield benefits for those individuals who live in environments that may be considered discovery enriched as a result of bridging social capital. Bonding social capital can also assist in the discovery process. A family in banking, for example, may discuss new financial activities and potential discoveries occurring in their business during the course of daily routine activities, such as a family dinner conversation. A member of such a family may recognize opportunities provided by this bonding strong tie social capital. Thus, we expect that individuals who come from families who own businesses (bonding social capital), or from community networks that own or encourage self-employment (bridging social capital), will utilize their individual level social capital resulting in more successful discovery activities than those who do not.

The exploitation process also provides individuals with an opportunity to leverage social capital resources. Aldrich and Zimmer (1986) found social factors instrumental in obtaining critical resources to exploit opportunities. Bonding social capital provides individuals with networks that facilitate the evaluation, procurement and utilization of resources necessary for exploitation. Bridging social capital, often based on weak ties at the individual level, utilizes what an individual has developed within their own associations, and reflects their own value structure, priorities and resource allocations. For example, we choose our own friends, and these relationships may provide resources (Greene and Brown, 1997). These resources may

include conventional factors of production such as capital, where assistance may facilitate relationships with an angel investor or a venture capitalist, as well as critical production or marketing information diffused through appropriate efficient networks. Thus, social capital is predicted to provide considerable resources when properly leveraged for the nascent entrepreneur, and may be of particular importance in environments of incomplete information and weak economic markets, such as new and nascent industries, products, markets and technologies (Leff, 1979).

At the organizational level, as nascent firms emerge and exploit opportunities, they also appropriate advantages provided by social capital. The importance of intra-organizational trust as a factor enhancing the performance and efficiency of organizations has been noted in, for example, the diamond market and ultra-orthodox Jews (Coleman, 1988) and among members of rotating credit associations (Coleman, 1990). Coleman refers to these social arrangements as having closure (Coleman, 1990). Such bonding social capital provides additional information of within group activity (intra-organizational), and provides efficiency gains through threats of censure or due to reciprocity. These gains translate into the exploitation of new opportunities by providing lower opportunity costs (Shane and Venkataraman, 2000).

Bridging social capital also assists new firms by linking different organizations through weak ties. Informal networks may facilitate the establishment of new firms through the use of multiple ownership and the ensuing relationships they bring (Teach et al., 1986). Network holes provide advantages for organizations composed of individuals who span different networks (Burt, 1980, 1992). Bridging social capital at the inter-organizational level consists of collective relations such as organizational networks, engaging in interdependent activities utilizing a web of overlapping structures based on loosely coupled open systems (Burt, 1980; Galaskiewicz and Wasserman, 1993; Pfeffer and Salancik, 1978). These networks serve as conduits of information about innovation, the availability and character of markets, products and resources.

In this study, we attempt to examine individual indicators of social capital that theoretically result in both bridging and bonding relationships, and consist of both strong and weak ties. We do not attempt to examine social capital at the firm level. Examples of bonding social capital based on strong ties may include having parents in business, being encouraged by family or close friends, and being married. Examples of bridging social capital based on weak ties may include membership in organizations, contacts with community agencies, business networks and the development of friendships with other businesspersons. Although we were unable to test social capital based on bridging weak ties with our control population, we tested variables indicative of both bonding strong ties and bridging weak ties at the individual level during various stages of our nascent entrepreneurial sample.

When studying organizational emergence over time, it is difficult to keep a clear demarcation between individual and organizational social capital (Adler and Kwon, 2002). We regard our analysis as a test primarily of individual rather than organizational social capital, although theory suggests that the social capital the nascent entrepreneur brings to their activities may promote inter- and intra-organizational relationships. We begin with the individual because we are studying per-emergent activity of what may become organizations

at a later stage. At the current state of knowledge, and with the data available, we do not feel we are in a position to predict which specific type(s) of individual social capital (bonding or bridging) will be more important for what aspect (discovery or exploitation) of nascent entrepreneurship. Instead, we predict a general positive effect of individual social capital. This discussion leads to the following hypotheses.

Hypothesis 4: Individual social capital will be positively associated with entrepreneurial discovery, as indicated by the probability of entering into nascent entrepreneurial activities.

Hypothesis 5: Individual social capital will be positively associated with successful exploitation in terms of being able to make the process move forward, as indicated by the frequency and pace by which nascent entrepreneurial activities are completed.

Hypothesis 6: Individual social capital will be positively associated with successful exploitation in terms of creating a viable business entity, as indicated by obtaining sales and achieving profitability.

4. Method

4.1. Design

Studies based on samples of established firms sometimes deal with questions related to the earliest stages of development, such as start-up motivations or how resources for the would-be business were acquired. This approach has serious shortcomings. Firstly, it has been estimated that only half of all aspiring business founders succeed in creating new organizations that are ever recorded in public records (Aldrich, 1999). Therefore, even samples of very young firms, where few have failed after once getting up and running, are subject to success bias. That is, the results are based solely on those cases that successfully completed and survived the creation process. We learn nothing about those that drop out early, and it cannot be ruled out that what appears as success factors among the survivors was equally characteristic for those efforts that were terminated at an early stage. Because abandoned efforts are censored, any factor that increases the dispersion of outcomes rather than their average level would falsely be interpreted as success factors. Secondly, research that investigates established cases and asks about their history suffers from potential bias due to memory decay and hindsight bias, or rationalization after the fact. This means that there is risk that outcomes are attributed to factors that were not truly present at the relevant time.

Another limitation of cross-sectional research is that it cannot determine at what stages of the entrepreneurial process different aspects of human and social capital are influential. Our design thus aims to overcome several methodological weaknesses of most earlier entrepreneurship research on human and social capital. We start by identifying a random sample of nascent entrepreneurs or start-up efforts at a very early stage, and then we follow that sample over time. By so doing, we can also include those efforts that fail or are abandoned at early

stages, thus, avoiding success bias and biases due to hindsight or memory decay. Further, we explicitly examine within the same study the influence of human and social capital on discovery as well as on exploitation. As regards discovery, we compare the human and social capital characteristics of nascent entrepreneurs to a control group from the general population. We then compare process progression and outcomes within the group of nascent entrepreneurs in order to assess exploitation success. This allows at least tentative conclusions as to whether the influences of human and social capital characteristics appear to be different at different stages of the entrepreneurial process.

4.2. Sample

Data are based on a two-part sample of randomly selected individuals living in Sweden. The first part of the sample consists of individuals aged between 16 and 70 years and the second part consists of individuals aged between 25 and 44 years. The purpose of the first was to get a representative sample of the adult population in Sweden, while the second was designed to increase the yield of nascent entrepreneurs. Previous research indicated that this age group has the highest rate of business founders (Reynolds, 1997).

Because nascent entrepreneurs constitute a relatively small group in society, we had to start with a very large sample of adult individuals. Every respondent went through a screening interview with the objective of selecting out the nascent entrepreneurs and a control group (a random 4% of the original sample). The wording associated with the nascent entrepreneur question was (in translation) as follows: Are you, alone or with others, now trying to start a new independent firm? Of the 49,979 individuals randomly selected, it was possible to obtain a telephone number for 35,971 (71.9%). The remaining 28.1% were not listed ($n = 13{,}338$), had severe disabilities ($n = 381$) or had moved abroad ($n = 289$). Of those contacted by telephone, 30,427 individuals (84.6%) agreed to participate. Out of these, 961 respondents qualified for the longer interview by answering in the screening interview that they were starting a business either independently (nascent entrepreneur) or as part of a current job assignment (nascent intrapreneur). We will focus here on nascent entrepreneurs only. The longer interview started immediately if possible, although in many cases the interviewer had to finish the screening and call back later. Failure to establish renewed contact lead to the loss of 147 cases. Another 132 individuals were dropped from the active case file after detecting, in the longer interview, that they did not qualify. As a result, 623 individuals completed the longer interview, as did a randomly selected control group of 608, from among the screened set that did not qualify as nascent entrepreneurs. From those who qualified for the longer interview, a final sample of 380 verified and accessible nascent entrepreneurs were identified (see Appendix A).

The initial interviews were conducted during the period of May–September 1998. The qualified nascent entrepreneurs were contacted for follow-up interviews as long as they were still active. The follow-ups were conducted after 6, 12 and 18 months. Sixty-one firms reported abandoning their activity following the initial screening: 44 in month 6, 8 in month 12 and 9 in month 18. Because all of these start-up efforts had done some gestation activities and some had a first sale, we elected to keep them in our analyses.

4.2.1. Nascent entrepreneur

An individual was considered a nascent entrepreneur if he or she initiated at least one gestation activity for a current, independent start-up by the time of the interview. Gestation activities were determined as any of 20 different behaviors that were considered demonstrative of actively beginning the business creation process (see Appendix B). A business was regarded as already started if 6 or more months before the study (a) money was invested, (b) income exceeded expenses and (c) the firm was already a legal entity (Carter et al., 1996). This left 380 nascent entrepreneurs that were compared with the control group. Note that while the nascent entrepreneur is always 'nascent' with regard to the current start-up effort, he or she may previously and/or concurrently (have) run other businesses. That is, not all nascent entrepreneurs are novices.

4.3. Measures

4.3.1. Dependent variables

Four different dependent variables were utilized in this study. The first dependent variable is our indicator of *discovery*. This is a dichotomous variable with the value 1 for nascent entrepreneur and 0 for the control group. This allows for the examination of human capital, social capital and control variables regarding the probability of engaging in nascent activity.

The remaining three dependent variables constitute our indicators of successful *exploitation*. The second and third dependent variables assess the progression of the exploitation process in terms of the number of gestation activities being undertaken. For this, we utilize a maximum number of 46 steps or sequences reflecting 20 gestation activities. For example, in Appendix B, we show two sequences towards obtaining a patent or copyright. Application is counted as one sequence, the granting or completion of the activity counted as a second sequence. Preparing a business plan, however informal, was coded 1, a written informal plan coded again as 1, and a formal written plan for external use was also identified. Thus, each nascent might receive anywhere from zero to three sequences under the business plan gestation behavior, with similar multiple sequence operations accounting for most of the gestation behaviors. Sequences were totalled at the time of initial screening (dependent variable 3) and over the course of three 6-month sampling points for the total at the end of the 18-month study (dependent variable 4). Note that, during the initial screening, there were only 38 sequences surveyed—eight additional sequences were added in all the subsequent waves. Gestation activities, which otherwise might have been considered a gestation sequence behavior, such as organizing a team or contact with an assistance agency, were omitted from the dependent variable because they were used instead as indicators of human or social capital.

The third dependent variable is a dummy variable indicating if any sales occurred at each successive interview wave. Although it does happen that sales occur early in the process (Bhave, 1994; Carter et al., 1996), a first sale often represents an evident instrumental indication of a nascent firm's eventual emergence. The fourth dependent variable identified those firms whose owners indicated that they were profitable at the time

of survey, at either the 6-, 12- or 18-month follow-ups. As profitability is both nominally essential and a primary goal of SMEs, we consider this to be a particularly good indicator of successful exploitation.

4.3.2. Human capital

Human capital of the nascent firm owners was determined by a number of indicators. Respondents were asked to indicate the highest level of education—representing explicit knowledge—they had completed. This variable, ranging from primary to doctorate, was coded into number of years. Much attention has focused on the specific training needs of nascent entrepreneurs. Classes are typically available providing a wide range of information, including legal, procedural, marketing and strategic aspects of starting a new business. We asked respondents if they had ever attended any classes or workshops on starting a business. Because we had no way of evaluating or comparing the different quality or range of course content, a dummy variable was created to indicate if they had ever attended a business course. One additional count was added for each of two classes, three classes and four or more classes. Individuals who had previously attempted a start-up were also noted, indicated by a dummy variable.

To examine tacit knowledge, respondents were also asked their total years of full time paid work experience in any field, to provide the experience variable. Supervisory or managerial experience was also assessed in terms of number of years. Years of experience and years of management experience were also squared and added to the equations to examine nonlinear effects. Since none were found, they were subsequently left out of the analysis.

4.3.3. Social capital

Social capital was determined utilizing a number of variables that, by varying degrees, capture the bonding–bridging or strong ties–weak ties dimensions, respectively. Several dummy variables were used as indicators of each type. For example, one indicator of bonding strong ties consisted of a dummy if either parent had ever owned a business before. As discussed in the theory section, this variable has been shown to be influential in a number of studies of entrepreneurship, and represents relationships characterized by high levels of relational reciprocity and trust. We use it to indicate evidence of personal business networks and relationships facilitated with the assistance of close family and friends. Variables were also constructed for those individuals who indicated that close friends or neighbors run their own businesses, and separately for those who agreed that their family, relatives and close friends were encouraging of their starting a business. As previously discussed, the family is a primary source of social organization, and has been shown to influence the probability of self-employment (Sanders and Nee, 1996). We include living with a spouse or partner as an additional indicator of strong ties that may be indicative of bonding social capital. Two questions examined factors typically consisting of bridging weak ties provided by individuals in the business community. These were available only for the nascent entrepreneurs and therefore were not used in the comparison with the control group. The first asked if the respondents had gotten involved in any business networks, such as trade associations, chambers of commerce or

service clubs such as the Lions or Rotary. Affirmative responses were coded 1 in a dummy variable. The second dummy was computed from a set of questions that explored their specific contacts with organizations that dispense business advice assistance in Sweden. Those who have sought assistance from any such organizations were coded one on this variable. An additional social capital indicative of bridging factors was to note if the nascent entrepreneur indicated s/he was a member of a start-up team as opposed to pursuing a solo start-up effort.

4.3.4. Control variables

In most countries, gender has been found to be a significant factor in the probability of establishing a business. Age has also been an associated factor—as individuals approach retirement age, they are less likely to invest in the activities necessary to start a new enterprise. We include these two variables as controls.

A correlation matrix for the entire data set, including the control and the nascent samples, is provided in Appendix C.

4.4. Model specification

The first model constructed was a binomial logistic regression, analyzing the probability of being a nascent entrepreneur as the dependent variable. The logistic regression tests the probability of a dichotomous event happening, in this case engaging in a nascent activity. The predicted proportion of activities follows the logistic model of $\ln P/(1-P_i) = \beta X_i$, where P_i is the probability of being a nascent entrepreneur (Hosmer and Lemeshow, 1989). The logarithmic odds of these events are held to be linearly affected by a vector of covariates X_i with coefficient vector β. A one-unit change in covariate j alters the probability that an individual will engage in one of the dependent variables by $\beta_j P_i(1-P_i)$. Logistic probabilities are given by maximum likelihood estimators and are provided for each group, those who engaged in the activity and those who did not. Each cell of the matrix of covariates and dependent variables is assigned a logistic probability. The null hypothesis is that the difference between observed and predicted outcomes (maximum likelihood estimates) in each cell of the logit table has occurred by chance. The maximum likelihood estimators calculate the logit (log odds) of an event occurring. Computing from log odds to probability, more commonly referred to as odds, is simply a matter of taking the coefficient to the e^x, and these probabilities are calculated and discussed for the reader's benefit in Section 5 (Hosmer and Lemeshow, 1989).

The analysis of gestation activity utilized multiple linear regression analysis, with the total number of gestation sequences as a dependent variable. The model was run using the number of completed gestation sequences at the time the survey began, as well as for total number of gestation sequences at the end of the 18-month period studied. Unstandardized regression coefficients and their significance levels were reported. For the analyses using first sales and probability as the dependent variables, we again employed logistic regression as described above. We used the SPSS statistical package for all statistical analyses.

5. Results

5.1. Results concerning human capital

Table 1 presents logistic regressions for the combined samples of control versus nascent entrepreneurs.

Eq. (1) examines the probability of being a nascent entrepreneur for the entire sample of 971 individuals, control group and nascents. Thus, it tests group differences regarding *discovery*. The goodness of fit Chi-square of 977 tests the null hypothesis that the coefficients for all of the terms in this model, except the constant, are zero (like an *f* test in regression). Chi-squared and log likelihood improvements show that the model is a statistically significant improvement ($P < .001$) over that with the constant alone, explaining the probability of an individual ever beginning gestation activities.

Table 1
Logistic regression, control group with nascent entrepreneurs

Eq. (1)—all cases	
Dependent variable	Nascent entrepreneur status
Independent variables	
Human capital	
Years education	0.167*** (0.033)
Years experience as manager	0.022 (0.014)
Years work experience	0.077*** (0.016)
Previous start-up experience	0.779*** (0.172)
Social capital	
Parents in business	0.327* (0.151)
Encouraged by friends or family	0.642*** (0.164)
Close friends or neighbors in business	0.707*** (0.180)
Married	− 0.042 (0.174)
Control variables	
Age	− 0.102*** (0.016)
Gender ($f = 1$)	− 0.756*** (0.156)
− 2 log likelihood	1085.6
Model χ^2	213.3***
df	10
Overall hit rate	72.1%
Pseudo-R^2	.26
Cases	996
Cases with missing data	25
N	971

Standard errors are in parentheses.
* $P < .05$.
*** $P < .001$.

We will concentrate initially on the human capital effects (Hypothesis 1) and return to the effects of the social capital indicators in Section 5.2. Explicit human capital as measured by years of schooling has a small significant and positive effect. Each additional year of education increases the probability of being a nascent by a factor of 1.18 ($0.167e^{x}$). Tacit human capital as measured by work experience has a very small positive effect on nascent activity. However, having previous management experience failed to demonstrate a significant effect. The strongest human capital variable appeared to be tacit knowledge acquired from previous start-up experience, where the effects provide the strongest coefficients in the equation. The logit probability (log odds) of people who report having previous start-up experience as being a nascent entrepreneur is 0.779 (increased probability by a factor of 2.17) and is statistically significant, indicating that generally, individuals with previous start-up experience are more likely to be nascent entrepreneurs than those who are not, controlling for the remaining variables in the equation. Note that this strong effect occurs in spite of the fact that many of those with previous experience may concurrently be occupied with running existing businesses in parallel to the novel start-up effort. Our supplemental analysis showed that the Wald statistic (coefficient/standard error, squared) was quite strong (Hosmer and Lemeshow, 1989). Thus, Hypothesis 1 is supported. Certain aspects of human capital, representing both tacit and explicit knowledge, do increase the probability of entrepreneurial discovery, i.e., of entering into nascent entrepreneurship.

Having established support for the notion that human capital has a positive effect on entrepreneurial discovery we now turn to the issue of successful *exploitation* of such discoveries. Table 2 presents OLS regressions for the nascent entrepreneurs, comparing the overall number of gestation sequences during the course of the study, with the summative sequences of both the entire 18-month period and the count at the very start. This analysis tests our Hypothesis 2, suggesting that human capital is positively associated with the ability to make the process move forward. Table 3 presents logistic regressions for the nascent entrepreneurs in terms of two critical outcomes: reporting any sales or being profitable during the 18-month study. This is our test of Hypothesis 3, that human capital is associated with the creation of a viable business entity. Because the logistic model computes each probability independently, we include all the relevant variables for consideration. Again, we will concentrate on the human capital effects in this subsection and return to the social capital effects in Section 5.2.

Eq. (2) in Table 2 examines the number of total gestation sequences that we found at the start of the initial screening activity. Both tacit and explicit human capital variables were only weakly associated with the total number of gestation sequences at the onset of the study. Significant effects appeared for years of experience as a manger and for having taken one or more business classes. Note that three sequences of the potential 46 reflect business class activity, thus, we anticipate a small measure of shared variance between the business classes taken independent variable and the dependent variable in this particular analysis.

Eq. (3) takes an approach similar to Eq. (2), and counts the total number of gestation sequences that occurred throughout the study, inclusive of those identified at the onset of the

Table 2
OLS regression, nascent entrepreneurs only

Dependent variable	Eq. (2)	Eq. (3)
	Sum all gestations at initial screening	Sum all gestations initial through 18 months
Independent variables		
Human capital		
Years education	− 0.006 (0.104)	− 0.006 (0.284)
Business classes taken	1.17* (0.546)	3.87** (1.49)
Years experience as manager	0.10* (0.05)	0.004 (0.135)
Years work experience	0.001 (0.053)	− 0.001 (0.146)
Previous start-up experience	0.705 (0.553)	4.841*** (1.45)
Social capital		
Parents in business	0.867 (0.494)	1.68 (1.34)
Encouraged by friends or family	0.948† (0.584)	4.23** (1.59)
Close friends or neighbors in business	0.835 (0.535)	3.17* (1.46)
Contact with assistance agency	1.08* (0.541)	1.94 (1.47)
Member of a start-up team	1.06*(0.511)	3.75** (1.39)
Member of a business network	2.69*** (0.574)	13.30*** (1.56)
Married	0.902 (0.572)	3.70* (1.56)
Control variables		
Age	0.003 (0.055)	0.006 (0.150)
Gender (f = 1)	− 0.354 (0.571)	− 2.70 ‡
Constant	5.66** (1.79)	7.35 (4.90)
R^2	.20	.30
F	6.53***	11.6***
df	14	14
N	378	378

Standard errors are in parentheses.
* $P < .05$.
** $P < .01$.
*** $P < .001$.
† $P = .105$.
‡ $P = .083$.

study. The R^2 of .30 suggests considerable explanatory power for an analysis of this kind. Two human capital variables appear significant and quite strong in this regression: having taken business classes (explicit) and having previous start-up experience (tacit). The other three human capital variables are statistically very weak and appear not to impact the pace of activity. Overall, Hypothesis 2 is partly supported. Some aspects of human capital—in particular previous start-up experience—are positively associated with successful exploitation in terms of being able to make the process move forward.

Eq. (4) in Table 3 is a logistic regression that examines the probability of having a first sale during the 18-month period of study. This constitutes the first part of our test of Hypothesis 3. It turns out that neither tacit nor explicit human capital variables are

Table 3
Logistic regression, nascent entrepreneurs only

Dependent variable	Eq. (4)	Eq. (5)
	Any sales in 18 months	Profitable in 18 months
Independent variables		
Human capital		
Years education	0.029 (0.049)	0.017 (0.048)
Business classes taken	0.315 (0.256)	0.131 (0.248)
Years experience as manager	− 0.019 (0.024)	− 0.038 (0.023)
Years work experience	− 0.001 (0.025)	− 0.003 (0.024)
Previous start-up experience	0.321 (0.253)	0.472 (0.243)
Social capital		
Parents in business	0.082 (0.232)	0.059 (0.225)
Encouraged by friends or family	0.236 (0.272)	0.023 (0.267)
Close friends or neighbors in business	0.431* (0.256)	0.206 (0.244)
Contact with assistance agency	− 0.197 (0.255)	− 0.266 (0.247)
Member of a start-up team	0.167 (0.239)	0.207 (0.232)
Member of a business network	1.471*** (0.318)	1.443*** (0.282)
Married	0.444 (0.262)	0.391 (0.259)
Control variables		
Age	0.013 (0.026)	0.018 (0.025)
Gender (f = 1)	− 0.083 (0.272)	− 0.059 (0.261)
− 2 log likelihood	455.264	478.73
Model χ^2	45.03***	13.2*
df	14	14
Overall hit rate	64.4%	66.2%
Pseudo-R^2	.18	.15
N	379	379

Standard errors are in parentheses.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

statistically significant in predicting the likelihood of having a first sale. Eq. (5) examines the probability of reporting a profit during the course of our study, further testing the hypothesis related to successful exploitation in terms of creating a viable business entity. The human capital variables are all statistically weak in this analysis, although most have positive coefficients. Thus, Hypothesis 3, stating that human capital is positively associated with establishment of a viable firm, was not supported.

5.2. Results concerning social capital

For a test of Hypothesis 4, suggesting individual social capital is positively associated with entrepreneurial discovery—we must return again to Table 1. The social capital

variables in this equation appear even more influential in determining the probability of nascent entrepreneurship than did the human capital indicators. This is in spite of the fact that only a few social capital indicators were available for the control group and hence could be used in this analysis. Married status was the only social capital indicator not to be ascribed a statistically significant effect. Having parents in business, the most evident bonding social capital variable, provided a coefficient of 0.327, increasing the odds of being a nascent entrepreneur by a factor of 1.4. Interestingly, indicators outside of the immediate family are ascribed the strongest effects. Being encouraged by friends produces a coefficient of 0.642, effectively increasing the odds of being a nascent entrepreneur by a factor of 1.9. Having close friends or neighbors in business is also strong and significant, fully doubling the odds of someone being a nascent entrepreneur ($0.707e^x = 2.0$). Hypothesis 4 is thus strongly supported. Individual social capital is positively associated with entrepreneurial discovery as indicated by the probability of entering into nascent entrepreneurial activity.

For a test of Hypothesis 5—that individual social capital is positively associated with successful exploitation as indicated by making the process move forward—we refer to the analyses in Table 2. In Eq. (2), all variables get the expected positive coefficient and three social capital variables reach statistical significance. Being a member of a business network has the strongest coefficient in the equation (2.69). Contact with an assistance agency and being a member of a start-up team also appeared to be associated with the gestation sequence activity prior to the first interview. In Eq. (3), which may be regarded a stronger test of the hypothesis, more indicators come out significant and the explanatory power is greater. Some of the social capital variables appear quite strong in the analysis. This is true of those indicators arguably more indicative of bonding social capital, as well as those arguably more indicative of bridging social capital. The variable membership in a business network again provided the strongest coefficient (13.23) in the entire equation, and being a member of a start-up team also had a positive and statistically significant influence. Leaning more toward the bonding domain, being encouraged by family or friends, having close friends in business, and being married all had statistically significant results in predicting gestation count activity. Overall, Hypothesis 5 is strongly supported. Social capital is positively associated with successful exploitation in terms of being able to make the process move forward.

Hypothesis 6 predicts that individual social capital is positively associated with successful exploitation in terms of achieving a first sale and profitability. For these analyses, we return to Eqs. (4) and (5) (Table 3). As regards sales, it turns out that only two of the social capital variables, having close friends or neighbors in business and being a member of a business network have positive and statistically significant results. Membership in a business network is particularly strong, increasing the odds of a nascent having a first sale by a factor of 4 ($1.47e^x = 4.34$). With regard to profitability, membership in a business network, again, demonstrates a very strong and positive relationship. Hypothesis 6 was clearly supported only by one of the social capital variables, being a member of a business network. As no other human or social capital indicators had a reliable influence on these outcomes, the overall performance (Pseudo-R^2) of the predictive models in Table 3 was rather weak.

6. Discussion

6.1. A summary and interpretation of the results

Our study empirically examined individual factors leading to both opportunity discovery and exploitation. We examined, at the individual level, tacit and explicit human capital factors, as well as bridging and bonding social capital, and we did so by including comparisons with a control group of non-nascent entrepreneurs, as well as longitudinal study of a population of nascent entrepreneurs.

Summarizing our human capital findings, we found effects of both tacit and explicit knowledge primarily during entrepreneurial discovery, i.e., in differentiating the nascent population from the general population. Swedish nascent entrepreneurs were better educated reflecting more explicit knowledge. Those with greater levels of human capital were more prone to discover opportunities perceived to be attractive enough to trigger taking steps towards starting their own businesses (Shane and Venkataraman, 2000). This finding concurs with previous studies examining new entrepreneurs (Bates, 1995; Robinson and Sexton, 1994). This suggests that despite methodological shortcomings such as success bias, previous research has not been off the mark on this issue.

We are still unsure as to what mechanisms govern this outcome. It may be that individuals with more knowledge objectively discover more and/or better business opportunities, but this is not the only possible interpretation. Perhaps individuals with higher amounts of human capital have greater self-confidence, enabling them to make a choice toward independent entrepreneurship. Alternatively, they may feel the risks are lower for them, in that they are more easily re-absorbed by the labor market should their venture fail (Shane and Venkataraman, 2000). It remains unclear if our results are primarily due to cognitive or motivational differences. We also found that nascent entrepreneurs had more work and start-up experience reflecting greater tacit knowledge. Our study suggests that while both elements of human capital are important for entrepreneurial discovery, tacit knowledge gained from previous start-up experience is particularly influential.

When we examined successful exploitation within the nascent entrepreneur sample, the effects of human capital indicators were weaker and much less consistent. With respect to gestation activity, there were no measurable effects for general, formal education. However, taking business classes did increase activity, as did previous start-up experience. It appeared that tacit knowledge was marginally more important during the exploitation process. Alternatively, the explicit versus tacit distinction does not fully account for the pattern that emerges from the results. The variables that are ascribed a positive effect with regard to the number of gestation activities carried out through the 18 months of the study are business education and previous start-up experience. One characteristic these have in common is that they are of more *specific* or immediate relevance to the task of starting a business than are the nonsignificant variables years of (any) education and years of (any) experience as manager.

None of the human capital variables were associated with obtaining a first sale or being profitable during the study. Our findings suggest that while human capital increases

the probability of becoming a nascent entrepreneur, it may not reliably differentiate successful from less successful entrepreneurial processes. Other factors, such as opportunity costs and propensity to accept risk may be more influential during exploitation (Shane and Venkataraman, 2000). Even the most specific type of explicit human capital, formal education as provided by business classes, only succeeded in increasing the pace of gestation activities, not in affecting critical outcomes. This possible difference between the roles of human capital for discovery versus for exploitation has not been highlighted in previous studies. This may in part explain seemingly conflicting findings. A plausible interpretation of our results is that both explicit and tacit human capital clearly facilitates entrepreneurial discovery and to some extent the ability to get ahead with the exploitation process, but also that human capital per se is not enough to ensure its successful completion. As the process unfolds, more specific human capital appears to increase in importance. We can only speculate about the precise reasons for this pattern. One possibility is that as the nascent process moves from discovery to exploitation, increasingly newer combinations of activities occur that are based on progressively more tacit forms of human capital. An alternative explanation is that human capital facilitates success only in conjunction with adequate levels of appropriate social capital, the effects of which we will turn to next. There is also the possibility that individuals with higher levels of human capital pursue higher potential opportunities that take longer time to develop to evident market success (Shane and Venkataraman, 2000).

Our findings regarding social capital were particularly robust and noteworthy. With respect to discovery, having parents and/or close friends or neighbors in business, as well as encouragement from friends and family, was strongly associated with probability of entry. We also found that social capital was important in predicting successful exploitation. However, the results do not compellingly point to the importance of specific knowledge. Encouragement also seems important. Encouragement by friends and family was quite strongly associated with the pace of gestation activity during our 18 months of study. The weaker tie (bridging) social capital variable member of a business network was consistently important and significant in predicting gestation activity at the start of our screening, and the pace during the following 18-month period. It was also a very strong predictor of having a first sale or in being profitable, where most other variables failed to show an influence. Being a member of a start-up team also demonstrated strong and significant results for gestation activity.

Although we did not have elaborate specific measures of either, the results seemed to indicate that bridging social capital becomes increasingly more important relative to bonding social capital, as the process progresses. In terms of types of ties, it seems that weak ties connecting to specific knowledge that the individual does not have which therefore is unlikely to be available within the close network of strong ties, becomes increasingly important as the process progresses.

We were somewhat surprised by the lack of effects from having contact with a designated assistance agency. They appeared not to provide the kind of assistance or access to resources expected of organizational networks. The agency contact variable was found to be a predictor in only one model—increasing the number of gestation

activities prior to entering our sample set. As part of our exploratory analysis, we discovered that individuals who had agency contact were more likely to produce a business plan, but we were unable to associate producing such a plan with any of our measures of success. Thus, there is some indication that the gestation activities advocated and advanced through assistance agencies are displaced from the real requirements for successful exploitation of entrepreneurial opportunities. Unlike a number of other social capital variables, there was no indication that agency contact was positively associated with the pace of gestation activity during the study, or with attaining a first sale or profitability.

Some overall patterns that emerge from our results are the following. Firstly, those individuals in the population with higher levels of bonding social capital are more disposed toward attempting to start a business enterprise. As we move from mere entry into a start-up process towards its successful completion, bridging social capital comes more to the fore, whereas the importance of human capital diminishes. This underlines that successful entrepreneurship is a social game (cf. Schoonhoven and Romanelli, 2001). Apparently, while human capital factors can explain discovery and, to some extent progression of the exploitation process, it is only when applied within the context of a relevant social structure that such qualities can help achieving successful outcomes. Secondly, the further we move from discovery towards its successful exploitation, the fewer human and social capital indicators are ascribed statistically significant positive effects, and hence the weaker is the overall explanatory power of the models. This suggests that relatively general and measurable characteristics like having or not having self-employed parents and/or a certain level of education, and being married, can with reasonable accuracy help predict who will and who will not enter into nascent entrepreneurship. When it comes to successful continuation and completion of the process, however, increasingly specialized knowledge, contacts or actions are required, i.e., aspects of human and social capital that are less general and therefore not very well captured by the type of measures we have used. Such an interpretation is supported when we look at which variables remain influential versus which drop out as we move from nascent versus control towards having achieved profitability. The variables that remain tend to be the more specific ones, whereas the more general variables drop out. Hence, business education but not general education appears important in the exploitation stage. The same is true for support from family and friends versus merely having access to parents or friends in business, and for previous start-up experience versus any work or management experience. This possibility of increased specificity of success factors over time is something that should be considered in the design of future studies.

6.2. Implications

Explicit human capital appears to be a good investment by increasing the probability of someone in the population entering into the nascent process. For those who have chosen to undertake nascent activities, formal business classes ought to provide more

directed assistance in creating profitable nascent enterprises. We found that while those who attended business classes had demonstrably more gestation activity, they were no more likely to be profitable or have a first sale than those who had not taken such classes. A similar pattern was discovered with those who had contact with agencies attempting to help small business establishments. Although they appeared to engage in more gestation activities initially, those with agency contacts were no more likely to be profitable or have a first sale. It appears as though more formal efforts to promote entrepreneurship often fail in their intended objectives. When one considers the complexity involved in both the discovery and the exploitation processes, it should come as no surprise that trainers who are not themselves experienced in the particular trajectories involved in exploitation fail to provide significant assistance. Our results seem to indicate that highly specialized knowledge and actions are required for successful exploitation. If so, the value of all forms of standard recipe is likely to be very limited, and the real needs beyond the capacity of a generalist advisor. This particular finding should come as a sharp warning to the business education establishment. The implications are that individuals are taught to engage in activities that are not necessarily productively linked toward successful outcomes. Of course, this is a preliminary result, limited to only one country. Subsequent cross-national longitudinal research focusing specifically on assistance will be necessary to confirm or refute these findings.

An area where we found much greater opportunity for intervention was that of social capital. We found several aspects of individual social capital to be very important predictors of who would elect to become a nascent entrepreneur. We also found them to be important at all stages of the nascent process, increasing the pace and—as regards membership in business networks—the probability of sales or profitability. For entrepreneurs and nascent entrepreneurs, our findings suggest the importance of actively maintaining, pursing, and developing social relations. In fact, our study suggests that these relations are more important than maintaining contact with assistance agencies, or even in taking general business classes. In particular, memberships in business networks appear to provide consistently strong results over the life of a nascent activity.

Previous start-up experience had strong positive effects on discovery as well as on exploitation. In contrast, managerial experience was not found to be a predictor during either process. This finding should be of importance to firms seeking to promote an intrapreneurial environment. Managerial activities may foster routines that do not facilitate opportunity recognition and/or a resource acquisition and allocation procedures that are not suited for successful entrepreneurial exploitation. Organizations seeking to promote new activities may want to consider developing their bridging social capital, much as successful nascent entrepreneurs appear to do. This may consist of building systems that promote and evaluate new opportunities outside the normative boundaries of the organizational hierarchy, or otherwise expanding or promoting linkages in order to widen potential sources of information and resources.

From a theoretical perspective, understanding the link between exploitation and social capital represents an important area of future research. From a public policy perspective, our research suggests that much of the activity related to training for the small business

sector, such as the format and production of business plans, may be missing the mark. This study suggests that the facilitation and support of business networks and associations may provide the most consistent and effective support for emerging businesses. For example, many communities now provide business incubators that offer subsidized rent, business advice, marketing assistance and encourage networking. With the growth of the Internet many new firms no longer require geographical space in the form of subsidized rent. They can conveniently work and grow their companies from their own homes, obviating the need for expensive rent subsidies. On the other hand, the virtual nature of many new businesses, as well as the rapid pace of technological change, highlights the importance of maintaining social relations and networks. Our research clearly indicates the value of effective networking activities, suggesting the importance in promoting and facilitating social relations and mentoring activities for nascent entrepreneurs. In conclusion, both entrepreneurs and public policy specialists may have cause to examine and increase their efforts to build social capital. Furthering our understanding of these specific nascent networks and learning how best to facilitate them represents an important activity for future entrepreneurship research.

Acknowledgements

This research owes intellectually to The Entrepreneurial Research Consortium (ERC), a temporary association of 30+ university centers and 100+ scholars who are carrying out the US Panel Study of Entrepreneurial Dynamics (PSED). We have in large part adopted the design developed by the ERC for its US study (in which we were also involved). The Swedish study has been made possible through financing from the Swedish Foundation for Small Business Research, the Knut and Alice Wallenberg's Foundation and the Swedish National Board for Industrial and Technical Development (NUTEK).

Appendix A

Sample and response rates

Category	Total
Individuals randomly sampled	49,979
Individuals with identifiable phone number	35,971
Individuals screened	*30,427*
Percentage	84.6%
Percentage yes to NE, NI item	3.2%
No. of yes answer to nascent entrepreneur or nascent intrapreneur item	*961*
Refused to volunteer	− 53
Not enough knowledge of Swedish	− 6

No contact, not clear if start-up	– 147
Started, but did not complete interview, because they were no longer starting a business (misunderstanding, changed situation)	– 132
No. of who accepted invitation to volunteer and completed long interview	*623*
Did not meet the gestation criteria (nascent intrapreneur; no gestation activities, already up-and-running, etc.)	– 233
Missing data	– 10
Nascent entrepreneurs analyzed	*380*

Appendix B

Twenty gestation behaviors and 46 gestation sequence questions

Gestation activity	Question
1. Business plan	Have you prepared a business plan?
1. Business plan	Is your plan written (includes informally for internal use)?
1. Business plan	Is your plan written formally for external use?
2. Development of product/service	At what stage of development is the product or service that will be provided to the customers?
3. Development of product/service	Idea or concept
3. Development of product/service	Initial development
3. Development of product/service	Tested on customers
3. Development of product/service	Ready for sale or delivery
4. Marketing	Have you started any marketing or promotional efforts?
4. Patent/copyright	Have you applied for a patent, copyright or trademark?
4. Patent/copyright	Has the patent, copyright or trademark been granted?
5. Raw material	Have you purchased any raw materials, inventory, supplies or components?
6. Equipment	Have you purchased, leased or rented any major items like equipment, facilities or property?
7. Gathering information	Have you gathered any information to estimate potential sales or revenues, such as sales forecasts or information on competition, customers and pricing?
7. Gathering information	Have you discussed the company's product or service with any potential customers yet?
8. Finance	Have you asked others or financial institutions for funds?
8. Finance	Has this activity been completed (successfully or not)?

8. Finance	Have you developed projected financial statements such as income and cash flow statements, break-even analysis?
9. Saved money	Have you saved money in order to start this business?
10. Credit with supplier	Have you established credit with a supplier?
11. Household help	Have you arranged childcare or household help to allow yourself time to work on the business?
12. Workforce	Are you presently devoting full time to the business, 35 or more hours per week?
12. Workforce	Do you have any part time employees working for the new company?
12. Workforce	How many employees are working full time for the new company? One?
12. Workforce	How many employees are working full time for the new company? Two?
12. Workforce	How many employees are working full time for the new company? Three or more?
13. Nonowners hired	Have you hired any employees or managers for pay, those that would not share ownership?
14. Education	Have you taken any classes or workshops on starting a business?
14. Education	How many classes or workshops have you taken part in? One only
14. Education	How many classes or workshops have you taken part in? Two only
14. Education	How many classes or workshops have you taken part in? Three or more
15. Contact information	Does the company have its own phone number?
15. Contact information	Does the company have its own mail address?
15. Contact information	Does anyone in the team have a mobile mainly used for the business?
15. Contact information	Does the company have its own visiting address?
15. Contact information	Does the company have its own fax number?
15. Contact information	Is there an e-mail or internet address for this new business?
15. Contact information	Has a web page or homepage been established for this business?
16. Gestation Marketing	Have you started any marketing or promotional efforts?
17. Gestation income	Do the monthly expenses include owner/manager salary in the computation of monthly expenses?
18. Obtained licenses	Has the new business obtained any business licenses or operating permits from any local, county or state government agencies?
19. Legal form	Has the new business paid any federal social security taxes?
19. Legal form	Has the company received a company tax certificate?
20. National specific	Have you applied for start-up benefits? (cf. U.K. ‘enterprise allowance scheme’)
20. National specific	Has the application (the answer) regarding start-up benefits been completed?
20. National specific	Has the new business received a company tax certificate?

Appendix C

Means, standard deviations and correlation coefficients for nascent entrepreneurs

Variable	Mean	S.D.	1	2	3	4	5	6
1. Years of education	12.58	2.57						
2. Business class taken	0.43	0.49	.037					
3. Years of experience as manager	5.11	6.48	−.025	−.041				
4. Years work experience	14.22	9.99	−.189**	−.018	.620**			
5. Previous start-up experience	0.37	0.48	.061	−.054	.244**	.168**		
6. Parent in business	0.48	0.50	−.008	.028	.102*	.013	.142**	
7. Encouragement	0.76	0.42	.001	.032	−.005	−.027	.019	.004
8. Friends in business	0.31	0.46	.115*	.049	.065	.064	.119*	.123*
9. Agency contact	0.38	0.488	.030	.376**	−.044	.021	−.035	−.006
10. Start-up team	0.56	0.49	.020	−.172**	.016	−.094	.150**	.045
11. Business network	0.26	0.43	.058	.225**	.061	.021	.069	.033
12. Age	37.76	9.62	.048	.049	.600**	.850**	.200**	.033
13. Gender	0.28	0.45	.066	.156**	−.096	−.114*	−.134**	.033
14. Married	0.74	0.43	.005	−.041	.094	.126*	.003	.010
15. Sum of all gestation at initial screening	11.37	5.17	−.004	.190**	.227*	.191**	.173**	.134**
16. Sum of all gestation through 18 months	25.73	15.07	.042	.209**	.123*	.090	.235**	.121*
17. Any sales	0.62	0.48	.073	.114*	.024	.039	.113*	.054
18. Profit	0.52	0.50	.060	.068	−.009	.019	.139**	.042

* $P < .05$, ** $P < .01$.

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7	8	9	10	11	12	13	14	15	16	17
.129*										
.055	.001									
.054	.006	−.088								
−.060	.063	.117*	−.107*							
−.077	.068	.079	−.099	.034						
.021	.042	.113*	−.064	.087	.031					
.027	−.001	−.025	.098	.062	.113*	.074				
.086	.121*	.154**	.063	.286**	.197**	.007	.099			
.113*	.165**	.135*	.097	.429**	.109*	−.021	.138**	.697**		
.035	.118*	.009	.015	.279*	.075	.036	.089	.470**	.603**	
−.005	.074	−.011	.025	.296**	.054	.023	.088	.415**	.524**	.814**

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