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Dipl.-Kfm., Dipl.-Psych. Thorsten Semrau

aus Köln

Referent: Professor Dr. Mark Ebers
Korreferent: Professor Dr. Detlef Schoder
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Chapter 1

Introduction

This thesis deals with the role of networks in different stages of the entrepreneurial process. The purpose of this first chapter is to provide a brief overview of the different streams of entrepreneurship research. Additionally, it outlines the influence of social networks on success in new venture creation and development and introduces the research questions that will be addressed in the following four chapters of this thesis. The studies presented in these chapters were conducted with three different co-researchers: Arndt Werner, who is the co-researcher of the studies presented in chapters two and three; Stefan Sigmund, with whom I conducted the study presented in chapter four and Michael Beier, the co-researcher of the study presented in chapter five.

1.1 Entrepreneurship Research

The question of 'who is an entrepreneur and who is not' has been widely discussed in entrepreneurship research (Carland, Hoy, Boulton & Carland, 1984; Gartner, 1985; Markman, Baron & Balkin, 2005; Shaver & Scott, 1991). Carland, Hoy and Carland (1988) argue that there is a need to differentiate between small businesses and entrepreneurial ventures and propose that the critical factors to distinguish between them are growth-orientation and innovativeness. In contrast, Gartner (1988, 1989), points to the many problems involved with so narrowly delimiting the concept of entrepreneurship, such as the problem of determining the degree of innovativeness of products or methods, and pleads for using the criterion of new venture creation to separate entrepreneurship research from other disciplines.

According to an empirical study among researchers dealing with the topic, new venture creation is the criterion most frequently used for conceptualizing entrepreneurship (Gartner, 1990) and the most commonly used operationalization in empirical studies (e.g., Aldrich, 1999; Carter, Gartner & Reynolds, 1996; Shane, 2003; VanderWerf & Brush, 1989). Therefore, this definition will not only be used when describing the field of entrepreneurship research in general but also in the remainder of this thesis.

Until the early 1980s, the major thrust of research in the field of entrepreneurship focused on the person- and personality-related factors, trying to prove that entrepreneurs are different from nonentrepreneurs (Aldrich, 1999; Gartner, 1989; Shaver & Scott, 1991). Even though certain person-related factors turned out to significantly influence entrepreneurial activity, it became obvious that these factors may only partially explain the phenomena of new venture creation and development (Frank, Lueger & Korunka, 2007; Gartner, 1985; Korunka, Frank, Lueger & Mugler, 2003). Building on this insight, Gartner (1985) was the first scholar to develop a comprehensive framework describing the variety of factors that contribute to explaining entrepreneurial activity and success. This framework, which is still widely recognized in entrepreneurship theory and research (see, e.g., Busenitz et al., 2003; Ireland & Webb, 2007; Kessler, 2007; Schmude, Welter & Heumann, 2008; Van Gelderen, Thurik & Bosma, 2006) comprises four interacting dimensions: a) the characteristics of the individual(s) starting the new venture, b) the organization which is created, c) the process by which a new venture is started and further developed and d) the environment surrounding entrepreneurs and their new ventures (Gartner, 1985).

Gartner's (1985) claim that all of these four dimensions have to be considered when trying to explain entrepreneurial activity and success has received wide empirical support. Romanelli (1989), for example, has shown that organizational and environmental factors as well as their interaction play a significant role in explaining new venture survival in the minicomputer industry. Similarly, Brush, Manolova and Edelman (2008) demonstrate that personal, environmental and organizational factors jointly influence the survival rates of established young ventures in the United States. Additionally, a recent meta-analysis shows that the performance of technology-based new ventures is significantly influenced by personal as well as organizational and environmental characteristics (Song, Podoynitsyna, van der Bij & Halman, 2008). Unfortunately, no such meta-analysis has so far been conducted that addresses success in new venture creation. The results of existing studies among nascent entrepreneurs, however, suggest that such an analysis might likely lead to similar results. Analyzing data from the Panel Study of Entrepreneurial Dynamics (PSED), Parker and Belghitar (2006) show that person-related as well as process and environmental factors exert a significant influence on success in new venture creation. Moreover, van Gelderen, Thurik and Bosma (2006) confirm this result by providing evidence for the relevance of all four perspectives for explaining success in new venture creation based on a longitudinal study of Dutch nascent entrepreneurs.

In view of these insights, the next sections provide an exemplary overview of the specific individual, organizational, process and environmental variables that research has identified as significantly influencing entrepreneurial activity and success. Afterwards, the impact of social networks—a factor that figures most prominently in contemporary entrepreneurship research (Hoang & Antoncic, 2003; Street & Cameron, 2007)—on new venture creation and development will be discussed in more detail and the research questions addressed in the following chapters of this thesis as well as their contribution to network research in entrepreneurship will be described.

1.1.1 Individual Characteristics and Entrepreneurial Activity

Particularly early research in entrepreneurship tried to explain differences in entrepreneurial activity and success based on differences in background and personality of entrepreneurs and nonentrepreneurs. Even though the value and validity of this approach has frequently been questioned, a considerable number of studies demonstrate that some psychological variables do indeed exert a significant influence on entrepreneurial activity and success (Frank et al., 2007; Gartner, 1985; Mitchell et al., 2002; Rauch & Frese, 2007; Shaver & Scott, 1991). Among those variables identified are several cognitive factors, such as risk taking propensity, confidence in one's skills or abilities and internal locus of control (Walter & Walter, 2009). Arenius and Minniti (2005), for example, provided confirming evidence for the notion that confidence in one's skills—a concept closely related to self-efficacy—is a very important component of the decision to start a new business, while fear of failure has a negative impact. This result has most recently been confirmed by Townsend, Busenitz and Arthurs (2010), who also provide evidence for the notion that confidence in one's ability to perform tasks relevant for making entrepreneurial progress is a valid predictor of starting a new venture. Finally, Hansemark (2003) has shown that an internal locus of control, defined as the perception of having a high degree of control over occurrences, has a strong predictive validity for starting a new business and Caliendo, Fossen and Kritikos (2009) show that the decision to start a new venture is significantly influenced by an individual's risk attitude.

However, perceptual variables are not the only individual characteristics that significantly influence individuals' intention and ability to create a new venture. Several researchers have shown that it is also fruitful to look at the variables describing entrepreneurs' backgrounds and experiences, such as previous work and founding experience, age and human capital to predict entrepreneurial

activity. There are, for example, several studies providing evidence for the proposition that younger individuals are more likely to start a new firm than older ones (see, e.g., Lévesque & Minniti, 2006). Additionally, being a migrant or having a migrant background turned out to have an impact on entrepreneurial activity. Analyzing the propensity to engage in entrepreneurship in the United Kingdom, Levie (2007), for example, found that migrant status and ethnicity increases the odds of engaging in new business activity on an individual level and grow migration flow seems to have a high impact on regional new business activity. This result is largely confirmed by other studies reporting a high entrepreneurship rate of migrants all over Europe (Baycan-Levent & Kundak, 2009).

Moreover, the human capital accumulated by individuals also significantly affects entrepreneurial activity and performance. Davidsson and Honig (2003), for example, have shown that general human capital, indicated by the number of years of education, has a significant impact on entering into nascent entrepreneurship and success in founding a new venture. Confirming this result, Brüderl, Preisendörder and Ziegler (1992) show that increased schooling and work experience are positively associated with new venture survival and Colombo and Grilli (2005) quite similarly demonstrate that founders' years of education does positively affect new venture growth. More fine-grained analysis revealed that the observed overall effect of human capital on entrepreneurial success is probably composed of a direct and an indirect one. While the direct effect is based on the fact that founders with higher amounts of human capital are more efficient in organizing and managing, the indirect one is grounded in the ability of higher educated entrepreneurs to identify more promising business ideas, which in turn makes it easier to attract investors, clients and suppliers (Brüderl et al., 1992). In addition to identifying these two different effects of human capital, researchers were also able to identify specific facets of human capital that have a particularly significant impact on entrepreneurial performance. Among those facets identified are: a) financial management capability, which turned out to significantly affect the probability that nascent entrepreneurs start a new venture and stay in business (Diochon, Menzies & Gasse, 2008), b) experience in the industry of the new firm, which is a valid predictor of firm survival and growth (Brüderl et al., 1992; Colombo & Grilli, 2005) and c) prior entrepreneurial experience, which is associated with superior growth of the newly founded venture (Colombo & Grilli, 2005). Finally there are some human capital-oriented studies indicating that entrepreneurs and entrepreneurial teams might profit from covering a wide spectrum of different competencies and stocks

of knowledge. In particular, Wagner (2006) has shown that having more different fields of experience increases the probability of becoming an entrepreneur. Quite similarly, Roure and Maidique (1986) provide evidence for the notion that the degree to which founding team members jointly cover the functional experiences needed for running a new venture has a positive impact on start-up success.

Besides addressing perceptual variables, entrepreneurs' backgrounds and experiences as well as age, researchers have also addressed gender as an explanatory variable for differences in entrepreneurial activity and success. In general, the studies doing so report that the participation rates of women in entrepreneurship are systematically below those of men (Langowitz & Minniti, 2007; Minniti, 2010). There are, however, several studies trying to shed more light on the causes for these differences. On the one hand, they revealed that men and women entrepreneurs differ very little with respect to demographic variables (Brush, 1992) and that the factors influencing female and male entrepreneurship tend to be comparable as well (Werner & Kay, 2006). On the other, it also became obvious that systematic human and social capital differences between men and women as well as greater liquidity constraints and a higher risk aversion of women may be responsible for the differences in entrepreneurial activity between the sexes (Arenius & Minniti, 2005; Werner & Kay, 2006). Additionally Langowitz and Minniti (2007) point out that differences in self perception and the perception of the entrepreneurial environment may contribute to an explanation of the observed differences in entrepreneurial activity.

1.1.2 Organizational Characteristics in Entrepreneurship Research

Focusing on the individual(s) founding a new venture, most of the early studies in entrepreneurship have not only neglected to address organizational variables as relevant for entrepreneurial activities and success but even failed to comment or communicate on characteristics of the organizations they analyzed (Busenitz et al., 2003). Recognizing that it may well have an impact on success in new venture creation and development whether a specific individual tries to set up a pet store, a business park or a management consultancy and whether he or she follows a specific market-entry strategy or another, this issue has been addressed by more recent research. As Busenitz et al. (2003) report as a result of examining entrepreneurship articles in leading management journals from 1985 to 1999, almost fifty per cent of the articles deal with the impact of management practices, the acquisition and deployment of resources, the development of systems or the effects of different strategies and structures on creating and developing a new

venture. Liao and Welsch (2008), for example, have shown that the venture creation processes of nascent entrepreneurs trying to set up either a technology-based or a non-technology-based business idea differ significantly in their venture creation process and that it takes significantly longer to complete the gestation process of a technology-based business. Additionally, further research results indicate that trying to set up a new venture in different industries comes with significant differences in disbanding rates (Brush et al., 2008) and that entrepreneurs trying to set up different businesses, such as businesses in the service or the manufacturing industry, profit from different environmental conditions (Brixy & Grotz, 2007).

In the field of established new ventures, Chandler and Hanks (1994) have shown that certain resource-based capabilities enable firms to follow distinct strategic alternatives such as cost leadership or differentiation on product and service quality, which in turn affect new venture performance. Additionally, Newbert, Kirchhoff and Walsh (2007) provide evidence for the notion that the performance of new ventures in the semiconductor silicon industry is largely influenced by their technological strategy. Specifically, they found that firms emphasizing a technology-push strategy, meaning that innovative products are created in the absence of a well-defined market demand, perform significantly better than firms strategically addressing a clearly defined but unsatisfied customer need.

The relevance of differences in resource endowments, capabilities and strategies are not the only organizational characteristics that have received attention in recent research. Analyzing a sample of small Dutch firms, Meijaard, Brand and Mosselman (2005), for example, have shed more light on the organizational structures of small firms. As a result of their study, they conclude that even though there is a strong correlation between departmentalization and firm size, small firms come in a wide variety of organizational structures. Moreover, they provided evidence indicating that even the performance of small firms may be significantly influenced by their organizational structure.

Finally, there are also studies trying to generate more insights on how organizational variables correspond with other attributes considered relevant for developing a new venture. Following this approach, Ostgaard and Birley (1994) for example, have shown a close connection between the competitive strategies followed by entrepreneurs and their networking activities in terms of amount of time and energy spent on developing and maintaining a personal network.

1.1.3 Research on the Entrepreneurial Process

The dynamic aspect of entrepreneurship has been acknowledged in the work of researchers addressing behaviors or tasks associated with founding a new venture. Aiming to identify similarities in sequences of actions undertaken to succeed in founding or further developing a new venture, earlier work following the process-oriented perspective has generated stage and phase models describing the processes of new venture formation and subsequent growth.

One of these earlier models of new venture creation has been developed by Wilken (1979), who identified three phases in the establishment of new enterprises—motivation, planning and establishment. Similarly, Reynolds (2007) and Reynolds, Carter, Gartner and Greene (2004) describe the process of founding a new venture as having three different stages and two major transitions—called conception and firm birth—in between these stages. Within the model, the first transition is triggered when the individuals not only think about trying to start a new business but also engage in activities that will help them to reach that objective; the second, when a nascent entrepreneur succeeds in creating a new venture (Aldrich, 1999; Carter et al., 1996; Reynolds et al., 2004).

However, researchers have not only developed stage models to describe the process of new venture formation. Focusing on later stages of corporate development, Greiner (1972) distinguishes five phases of organizational growth which are each characterized by a specific management style and specific management problems that have to be solved before growth may continue. Similarly, Churchill and Lewis (1983) describe five different stages through which small companies have to pass when pursuing growth. For every one of these stages the authors describe characteristic patterns of business size, management style and organizational goals (Churchill & Lewis, 1983). Finally, Ruhnka and Young (1987) established a model of the development process for new ventures that is based on interviews with venture capitalists. In analyzing the data generated by interviewing either the CEOs or managing partners of 73 U.S. venture capital firms, they also distinguish five different stages of new venture development that are characterized by specific developmental goals and major risks involved (Ruhnka & Young, 1987).

Even though the process of new venture creation and development has so often been depicted as composed of different sequential steps, models referring to a linear sequence of events have frequently been criticized for having no reliable empirical basis and running counter to anecdotal evidence on venture creation provided by entrepreneurs (Liao, Welsch & Tan, 2005). Consequently, recent

research in the field has addressed this issue empirically and provides confirming evidence for the reservations against linear stage and phase models. Specifically, the results generated suggest that even though a certain set of entrepreneurial activities, such as organizing a founding team, preparing a business plan, investing money and asking for additional funding could be identified as typical for almost every founding process (Reynolds & Miller, 1992), no clear chronological order of tasks accomplishment emerged (Liao et al., 2005).

More recent research following the process-oriented perspective has thus shifted its focus to analyzing how fulfilling certain entrepreneurial tasks may impact success in new venture creation and development. Doing so, Delmar and Shane (2003) and Shane and Delmar (2004), for example, were able to provide confirming evidence for the notion that business planning helps firm founders to turn abstract goals into concrete operational steps, make more profound decisions and thus fosters success in the creation of a new organization. Moreover, Delmar and Shane (2004) present empirical results showing that fulfilling the task of establishing a legal identity enhances a new venture's legitimacy and thus facilitates the transition to other organizing activities. Finally, van Gelderen, Thurik and Bosma (2006) have shown that the effort with which people pursue the completion of start-up activities has a significant positive impact on success in new venture creation. In particular they provide evidence for the hypothesis that working on a start-up full time significantly increases the probability of succeeding in new venture creation.

1.1.4 Environmental Influences on Entrepreneurial Activities

Acknowledging that new venture creation and development is not carried out in a vacuum, recent entrepreneurship research has also addressed the question of how certain environmental characteristics affect entrepreneurial activities and success.

On a most general level, studies addressing this question have analyzed how national differences in terms of culture and institutional environment impact entrepreneurial activities. Following this approach, Acs, Desai and Klapper (2008) have found significant national differences in entrepreneurial activity when analyzing data from the Global Entrepreneurship Monitor (GEM) as well as the World Bank Group Entrepreneurship Survey. They explain their result by arguing that differences in entrepreneurial activities may be a result of differences in access to formal financing and labor contracts as well as tax differences in different countries (Acs et al., 2008). Also relying on GEM data, Tominc and Rebernik (2007) compared differences in entrepreneurial activities

in several post-socialist countries. Based on their analysis, they conclude that differences in the cultural support for entrepreneurial behavior in different countries also have a significant effect on new venture formation and development. Besides these national differences, regional differences within a specific country also turned out to significantly affect founding activities and success. Specifically, Mueller (2006) has shown that the regional entrepreneurial environments in Germany have a significant impact on the decision of entering the process of new venture creation.

Researchers have not only addressed environmental influences on a national or regional level, but have also addressed how specific environmental conditions such as access to institutions such as science parks, business incubators and universities affect entrepreneurial activity and success (Aernoudt, 2004; Phan, Siegel & Wright, 2005). However, even though extant literature deals with this as a major topic, there is still almost no clear direct empirical evidence indicating the effectiveness of science parks and business incubators (Phan et al., 2005). Indirect evidence for what is needed to make business incubators effective is provided by empirical studies shedding light on the role of universities in the entrepreneurial process. In particular, there are several results demonstrating that universities may impact entrepreneurial activities by: a) offering entrepreneurship education and b) offering additional services and support for founding and developing a new venture (Markman, Phan, Balkin & Gianiodis, 2005; Vesper & Gartner, 1997). Providing evidence for the impact of entrepreneurship education on entrepreneurial activities, Walter and Walter (2008) as well as Wu & Jung (2008), for example, show that especially pragmatic and application-oriented entrepreneurship programs have a significant impact on students' willingness and their ability to found a new venture.

Research also provides conforming empirical evidence for the impact of additional services offered by universities on entrepreneurial activity. Specifically, Markman, Phan, Balkin and Gianiodis (2005) have shown that university technology transfer offices serving as technology intermediaries have a relevant impact on new venture performance. Additionally, Mian (1997) provides empirical evidence for the proposition that universities maintaining a technology business incubator and offering university–related inputs, such as laboratories and equipment, as well as student employees, add major value to client firms and thus foster entrepreneurial activity and success. These results are confirmed by a most recent study in the field showing that academic-spin-offs that had access to university infrastructure and received informal support by former colleagues establish significantly faster than others (Müller, 2010).

Closely related to the observation that support granted by institutions in the immediate environment has an impact on entrepreneurs in different stages of the founding process, researchers have also found that entrepreneurial activities and success are largely influenced by entrepreneurs' social networks (for recent overviews, see, e.g., Hoang & Antoncic, 2003; Street & Cameron, 2007). The relevance of this factor for new venture creation and development as well as the network-related research questions addressed in the following chapters will be described in detail in the next section.

1.2 Networks in New Venture Creation and Development

In the 1980s, researchers began arguing that every entrepreneur is embedded in a network, which is defined as a set of individuals and organizations and the linkages between these actors (Hoang & Antoncic, 2003; Lechner, Dowling & Welpe, 2006), and that this network plays a critical role in new venture formation and development. The rationale given for the importance of social networks in the entrepreneurial process is a rather simple one: as also reflected by "the fundamental proposition of social capital theory" (Nahapiet & Ghoshal, 1998, p. 252), networks are seen as providing access to resources. More specifically, they are seen as providing resources to much better conditions than traditional market exchange or vertical integration (Larson, 1992; Uzzi, 1999; Uzzi & Lancaster, 2004) and are thus considered especially important for entrepreneurs and emergent firms who typically suffer from financial as well as other resource constraints (Aldrich, 1999; Batjargal, 2005; Hite & Hesterly, 2001; Steier & Greenwood, 1995).

1.2.1 Networks and New Venture Creation

When trying to start a new venture, nascent entrepreneurs face many different challenges. To master these challenges, nascent entrepreneurs need a great variety of tangible and intangible resources, which they typically do not possess in sufficient quantity or quality (Carter et al., 1996; Ucbasaran, Westhead & Wright, 2001). Thus, network relationships providing the opportunity to mobilize additional resources are considered important to secure success in new venture creation (Aldrich, 1999; Bowey & Easton, 2007; Casson & Giusta, 2007; Greve & Salaff, 2003; Hanlon & Saunders, 2007; Kim & Aldrich, 2005; Starr & Macmillan, 1990).

Empirically, the question of whether, how and to what extent networks provide access to resources relevant for setting up a new venture has so far, however,

only been rarely addressed. There are only some exploratory studies in the field of nascent entrepreneurs providing evidence for the notion that networks are helpful for mobilizing financial resources and information (Jack, 2005; Yoo, 2000). In contrast, the vast majority of studies in the field of nascent entrepreneurship only indirectly address this question. They analyze whether certain network characteristics like size, intensity or quality of relationships have a significant influence on successfully creating a new venture. The results of these studies, however, are mixed. On the one hand, Davidsson and Honig (2003), for example, provide empirical evidence for the proposition that nascent entrepreneurs supported by business network contacts, family members, relatives and friends are more successful in advancing through the start-up process than others. Similarly, Aldrich, Rosen and Woodward (1987) find that entrepreneurs who spent more time on developing and maintaining network contacts are more successful in founding a business. However, Aldrich, Rosen and Woodward (1987) also conclude that the number of contacts nascent entrepreneurs relied on has no significant effect on business start-up success and Johannison (1996) provides further evidence for this notion. These mixed results may be partially explained by several theoretical treatises in the field arguing that developing and maintaining network relationships may not be all beneficial for nascent entrepreneurs because these actions also entail opportunity costs (Ebers & Grandori, 1997; Johannisson, 1996; Witt, 2004). Empirically, Watson (2007) provides first evidence confirming this proposition by showing that the relationship between networking activities and firm survival of established new ventures may best be described by an inverted U-shaped function.

Based on these arguments and results, the first part of this thesis tries to shed further light on the relationship between networks, network-related costs and benefits and success in founding a new venture. The first study presented is based on cross-sectional data from nascent entrepreneurs in Germany. It focuses on how nascent entrepreneurs' network investments impact resource access. More specifically, we analyze how a) the time nascent entrepreneurs spend on their network relationships b) the number of relationships they hold, affect the probability that they may access resources relevant for founding the new venture via their network contacts. By addressing this question, the study sheds first light on how the two variables that determine the opportunity costs of network maintenance affect network revenues.

The second study presented is based on the first but goes one step further. Based on longitudinal data from a subsample of those nascent entrepreneurs participating in the first study, we address the question of how the

aforementioned network investment variables influence success in new venture creation. In contrast to the first study, which analyzes the relationship between network investments and their direct revenues in terms of resource access, the second study allows a detailed assessment of how the interplay of network costs and benefits coming along with holding more network relationships and spending more time on developing and maintaining a given number of network contacts affects success in new venture creation.

1.2.2 Network Dynamics and New Venture Development

As several studies in the field show, it is not only nascent entrepreneurs who rely on support granted by their network members (Hoang & Antoncic, 2003; Honig, Lerner & Raban, 2006; Jarillo, 1989b; Stuart, Hoang & Hybels, 1999). Even after a new venture is founded, entrepreneurs usually need a variety of tangible and intangible assets, which they do not have in sufficient quantity or quality. However, a network that may provide all the resources necessary for further developing a new venture usually does not exist when a new business is founded (Hite, 2005; Hite & Hesterly, 2001). In the beginning, the network of a new venture is typically made up of relatives, friends and acquaintances of its founder(s). Since it is unlikely that these network contacts will be able to provide all the resources needed for successfully developing a new venture, entrepreneurs have to adapt their network to be able to further develop their new business (Lechner & Dowling, 2003; Witt, 2004).

Addressing the issue of network development, there are several studies clearly showing that different groups of factors—namely, environmental and firm, as well as individual and prior network characteristics—have a significant impact on network size (Stuart & Sorenson, 2007). With respect to environmental characteristics, it has been observed that new ventures have more network relationships when they are confronted with an uncertain technological environment (Steensma, Marino & Weaver, 2000), are affected by network externalities or industry standards (Ahuja, 2000), or face intense competition in their industry (Eisenhardt & Schoonhoven, 1996). Additionally, firm characteristics such as the number of patents held by a new venture (Colombo, Grilli & Piva, 2006; Herneric, Fragg, Hommel & Witt, 2008), a new venture's resource needs (Batjargal, 2006) and the diversity of the founding team (Beckman, Burton & O'Reilly, 2007) seem to influence the presence of inter-organizational relationships. Moreover, the development of a firm's network is affected by individual-level factors like the human capital of the entrepreneurs

(Burton, Sorensen & Beckman, 2002; Mosey & Wright, 2007), their family background (Anderson & Miller, 2003) and their attitude towards networking (Neergaard & Madsen, 2004; Sorenson, Folker & Brigham, 2008). Finally, the prior networks of a new venture's initial network partner seem to have an influence on further network development as well (Milanov & Fernhaber, 2009).

Notwithstanding these findings, the field of new venture network development is still an underdeveloped one (Hoang & Antoncic, 2003; Street & Cameron, 2007; Stuart & Sorenson, 2007). First, there are virtually no studies simultaneously analyzing how the factors considered important for network development affect new venture performance via influencing network structure. Second, there is a dearth of research on how entrepreneurs and new ventures as strategic actors may actually influence the development of their network (Oczan & Eisenhardt, 2009; Stuart & Sorenson, 2007). Finally, with the vast majority of quantitative studies in the field empirically focusing on network size as a proxy for network development, we still lack clear empirical insights on 'real' network change in terms of its "two evolutionary 'primitives'—the creation and dissolution of ties" (Koka, Madhavan & Prescott, 2006, p. 721).

Chapters four and five of this thesis address these issues. The study presented in the fourth chapter analyzes how entrepreneurs' individual networking abilities affect new venture performance in terms of business volume and business volume growth by influencing a new venture's network size. Additionally, the moderating role of new venture age for the hypothesized relationship will be analyzed to shed light on factors limiting the influence of entrepreneurs' personal attributes on the formation of new ventures' networks and success.

In contrast, chapter five analyzes whether and to what extent entrepreneurs may foster network change and network management capacity by applying the general means of organizational design to their relationship management. More specifically, we analyze how a specialized and integrated relationship management fosters change in new ventures' networks in terms of facilitating the development of new relationships, the dissolution of existing ties and the size of a new venture's network.

Before the studies addressing the outlined research questions are presented, it is important to note that the networks addressed in chapters two and three differ significantly from those addressed in chapters four and five. As clearly indicated by the respective items used, the networks that are addressed in the first part of this thesis comprise all the contacts held by a nascent entrepreneur that might potentially be useful in terms of providing resources for setting up a new venture.

In contrast, the networks addressed in the second part of this thesis are much more restrictively defined. Here, only relationships that are characterized by an ongoing resource exchange that clearly goes beyond simple market exchange are considered. Based on these differences—which also become empirically evident when considering the average network size differences of 14 network contacts in the first two studies and of four network relationships in the third and fourth study—the hypothesized relationships between network size and success in both parts of this thesis also differ significantly.

Chapter 2

How exactly do network investments pay off? The impact of nascent entrepreneurs' network investments on resource access

2.1 Introduction

Over the past decade, entrepreneurship research has made considerable efforts to understand the factors influencing success in new venture creation and development. Representing one factor that figures most prominently in this stream of research are social networks (Street & Cameron, 2007). Focusing on the relationship between networks and founding success, previous research provides strong evidence that network variables such as network size, the time spent on developing and maintaining network relationships, the frequency of communication, network heterogeneity, the closeness or broadness of relationships and membership in business networks are positively and significantly associated with founding success and early start-up performance (Aldrich et al., 1987; Brüderl & Preisendorfer, 1998; Davidsson & Honig, 2003; Hansen, 1995; Renzulli, Aldrich & Moody, 2000).

The rationale given for this positive relationship is a rather simple one, and it reflects one of the fundamental propositions of social capital theory: entrepreneurs are seen as gaining valuable and necessary resources through their networks (Batjargal, 2003; Liao & Welsch, 2005). In fact, some authors even describe networks as the foremost and fundamental source for the information and resource support needed to successfully start a new venture (Yoo, 2000).

Surprisingly, however, even though network literature often emphasizes the impact of networks on founding success, we still know very little about how networks and networking activities affect the availability of different resources needed for founding a new venture. In fact, this question has—with notable exception of a few exploratory treaties (Jack, 2005; Yoo, 2000)—been almost completely neglected by empirical research on nascent entrepreneurs to date (Witt, 2004). And even in the field of established ventures, there are only a few quantitative studies available that address the access to specific resources as an outcome variable. Among those, the majority focus on access to financial capital

and show how network partners' reputation and legitimacy influence market capitalization (Stuart, Hoang & Hybels, 1999), the accumulated financial capital invested in a company (Honig, Lerner & Raban, 2006) and IPO success (Gulati & Higgins, 2003). Additionally, there is one study showing that friendship-based ties positively affect venture capitalists' investment decisions (Batjargal & Liu, 2004). Access to other relevant start-up resources such as emotional support, information and additional business contacts, however, has so far not been empirically analyzed.

This lack of empirical research addressing network outcomes in detail is even more surprising when considering that recent research results point to negative effects of extensive networks and networking activities, which may even hinder successful new venture development. Analyzing the connection between networking activities and firm survival, Watson (2007), for example, finds that this relationship may be best described by an inverted U-shaped function. He explains this result by hypothesizing that the marginal benefits from further networking activities may be offset by their negative impact on the owner's time available for important internal business affairs. Considering this result and the more general notion that maintaining network relationships comes along with opportunity costs of time and resources necessary to develop and maintain network relationships (Ebers & Grandori, 1997; Johannisson, 1996; Witt, 2004), we argue that it is worth looking at the relationship between the time invested in maintaining network relationships and the outcome of this investment in terms of resource access granted in more detail.

In the study at hand, we will therefore analyze how investments in network size and investments in relationship quality—two variables determining how much time nascent entrepreneurs spend on maintaining their network in total—pay off in terms of affecting resource access provided by the network. We first draw on network and social capital theory and derive two hypotheses stating that investments in network size as well as investments in relationship quality lead to positive but diminishing marginal resource returns. We then test these hypotheses using a sample of 416 nascent entrepreneurs from Germany.

Our results provide broad support for our hypotheses. In fact, we find that increasing network investments lead to positive but diminishing returns in terms of access to information, financial capital and emotional support, as well as additional business contacts. Furthermore, we observe that the network investments necessary to access these resources differ considerably according to resource type and discuss two complementary explanations for this effect.

Considering our results, we see the following contributions of our study: in providing a theoretical reasoning and empirical evidence for positive but diminishing resource returns of increasing network investments, we specify network theory and give a partial explanation for the inverted U-shaped relationship between networking activity and entrepreneurial success observed by Watson (2007). We further develop network theory by showing that the effects of network investments on the access to resources vary considerably with the resource type and providing an explanation for this result based on a network partner's perspective. Finally, we believe that our results have considerable practical implications for the efficient network management of nascent entrepreneurs.

The rest of the chapter is organized as follows. In the following section, we present our theoretical framework and derive testable hypotheses. Next, we describe our research method and data. Then, we present the results of our study, which we discuss in the section that follows. Finally, we present our conclusions and some limitations of our study.

2.2 Theory and Hypotheses

The process of new venture formation has been described in several different phase and stage models. Wilken (1979), for example, distinguishes three phases in the establishment of enterprises—motivation, planning and establishment. Similarly, Reynolds (2007) and Reynolds, Carter, Gartner and Greene (2004) describe different stages and transitions between these stages that together constitute the founding process. Now, even though it is widely recognized that a) entrepreneurs do not progress through the stages posited automatically or at the same rate and b) the borders between these stages may be blurred, phase and stage concepts have proven their usefulness in describing the preconditions of new firm emergence (Aldrich, 1999; Bhave, 1994). In the following, we will therefore draw on the work of Reynolds et al. (2004) to describe why and how social networks are relevant for success in new venture formation.

According to Reynolds et al. (2004), the process of founding a new venture can be described by outlining different stages with two major transitions—conception and firm birth—in between them. Within the model, the first transition is triggered when the individuals not only think about trying to start a new business but also engage themselves in activities to help them reach that objective. If an individual has not yet succeeded in making the second transition and founding a new business, he or she is called a nascent entrepreneur (Aldrich, 1999; Carter et

al., 1996; Reynolds et al., 2004). To successfully start operating a new venture, nascent entrepreneurs have to fulfill many different tasks, such as writing a business plan, developing their first product models or prototypes, creating a legal identity and organizing a start-up team (Aldrich, 1999; Carter et al., 1996; Liao & Welsch, 2005; Reynolds et al., 2004). To meet the requirements associated with fulfilling these tasks, entrepreneurs need many different resources, which they usually do not have in sufficient quantity or with sufficient quality. Consequently, nascent entrepreneurs have to mobilize additional resources (Aldrich, 1999; Hanlon & Saunders, 2007; Yoo, 2000), of which social networks are seen as the major source (Aldrich, 1999; Bowey & Easton, 2007; Casson & Giusta, 2007; Greve & Salaff, 2003; Hanlon & Saunders, 2007; Starr & Macmillan, 1990). As posited in entrepreneurship theory and research, the variety of resources that nascent entrepreneurs may mobilize through their networks is considerable. According to Aldrich et al. (1987), as well as Aldrich (1999), nascent entrepreneurs obtain resources such as money, social support, product ideas and information through social network members. Quite similarly, and based on interview data from Korean entrepreneurs, Yoo (2000) posits that the major resources that nascent entrepreneurs mobilize via network contacts are knowledge, information and financial capital. If we combine these results with other insights in the field, four main categories of resources that nascent entrepreneurs may obtain via social contacts emerge: (1) financial capital (Casson & Giusta, 2007; Hanlon & Saunders, 2007); (2) guidance, information and knowledge (Liao & Welsch, 2005; Yoo, 2000); (3) social or emotional support (Liao & Welsch, 2005; Reynolds, 2007); and (4) contacts with potential customers, investors or consultants (Aldrich, 1999; Aldrich et al., 1987).

However, even though social networks are seen as a major source of financial, informational, emotional and contact support for a nascent entrepreneur, one has to keep in mind that the mere existence of a network with social contacts does not necessarily mean that a nascent entrepreneur gains access to the resources he or she needs. As social capital theory proposes, certain network variables such as the size of a network and the characteristics of the relationships between nascent entrepreneurs and the members of their network significantly influence the amount of resources they may achieve through network contacts (Batjargal, 2003; Burt, 1992; Liao & Welsch, 2005; Stam & Elfring, 2008). Additionally, research has shown that maintaining network relationships is not only beneficial but also bears disadvantages. According to Ebers and Grandori (1997) or Witt (2004), for example, two types of costs come along with securing the opportunity to access resources via network contacts: first, there are direct costs stemming

from the need to deliver services, information or other resources in exchange for those resources obtained from network partners. Second, there are indirect costs stemming from the time spent on maintaining network relationships (Watson, 2007; Zhao & Aram, 1995). While the direct costs in terms of resource obligations can be seen as the price for obtaining specific resources via network exchange, which is usually still more favorable than the one realized in market relationships (Uzzi, 1999; Uzzi & Lancaster, 2004), the indirect or opportunity costs are specific for network relationships. To establish and maintain a network tie that might be useful in terms of potentially providing resources crucial for founding a new venture, nascent entrepreneurs have to invest time and energy in the first place, which negatively impact their time available for other tasks that are important for founding a new venture. As a result, investing more time in maintaining network relationships is only beneficial for nascent entrepreneurs if the costs are outweighed by resource returns. Based on this, we will in the following develop and test detailed hypotheses on how investments in network size and relationship quality—two variables that determine the indirect costs of network maintenance—do pay off in terms of affecting nascent entrepreneurs' access to resources crucial for founding a new venture.

2.2.1 Investments in Network Size and Resource Access

Connected to the size of a network is the time that people have to spend on maintaining their network contacts (Greve, 1995; Greve & Salaff, 2003). With the time spent per contact (which we will address as a variable in the following section) kept constant, the size of a network directly represents the total amount of time a nascent entrepreneur spends on maintaining his or her network relations. Consequently, the opportunity costs of time that come along with maintaining network relations increase with network size, as extending the network decreases the time they can attend to other tasks necessary for founding a new venture.

But greater network size does not only come along with higher costs. As social capital theory proposes, the time invested in a larger network may pay off because network contacts provide access to resources, and the size of a network indicates how many different resource holders a nascent entrepreneur can rely on when establishing his venture (Adler & Kwon, 2002; Batjargal, 2003; Nahapiet & Ghoshal, 1998). If a network is larger, it is comprised of more people, who may own resources necessary for succeeding in founding a new venture. Therefore, the opportunity to leverage resources through an existing network will

increase with network size. However, not only the mere quantity of resources within the network is affected by network size. As Greve and Salaff (2003) and Greve (1995) argue for the case of information networks, having a large number of people within the network increases the possibility of receiving diverse information. The reasoning behind this proposition is that people differ with respect to their stocks of knowledge. Therefore, including additional ties to a network most probably increases not only the quantity but also the variety of information and knowledge available to a nascent entrepreneur. However, people do not only differ in what but also in whom they know as well as their endowment with financial capital and other physical assets. We therefore more generally expect the probability of including complementary resources to a network when adding a new tie is considerable, even when nascent entrepreneurs are not strategically seeking new network partners. Consequently, we expect that a nascent entrepreneur may access a specific resource when needed to increase with network size (Batjargal, 2003; Hansen, Podolny & Pfeffer, 2001; Liao & Welsch, 2003).

However, we do not expect the rate at which the probability of receiving the resources needed increases with network size to be constant. Whereas adding more partners to a small network will significantly enhance the probability that necessary resources become available, this increase in probability will diminish when a network grows. When a network is already of considerable size, adding more contacts to the network will much more likely mean adding people with resources already available. We therefore expect the likelihood of adding ties with necessary and non-redundant resources that provide additional value to decrease with network size. Accordingly, we hypothesize that the relationship between the time that nascent entrepreneurs invest in their network by extending its size and their access to resources relevant for founding a new venture such as money, knowledge and information as well as emotional support will be positive but diminishing:

> ***H1****: There will be a positive but concave relationship between nascent entrepreneur's investments in network size and the access to start-up relevant resources granted by network members.*

2.2.2 Investments in Relationship Quality and Resource Access

As mentioned above, the amount of time nascent entrepreneurs invest in maintaining their network contacts in total varies with network size. However, network size is not the only variable influencing this time total. Even when

holding the same number of relationships, nascent entrepreneurs may invest different amounts of time in maintaining their network by choosing to invest more or less time in every single relationship (Greve, 1995). Following Aldrich and Reese (1993) as well as Chell and Bains (2000), we now argue that the amount of time invested in every single network relationship is a variable worth looking at when trying to shed light on the question of how network investments pay off.

Conversely to what we have described above, the time spent per contact determines the time a nascent entrepreneur spends on maintaining his or her network when keeping network size constant. Consequently, the time nascent entrepreneurs spent on maintaining every network contact also determines the opportunity costs of time arising from the network. However, in a manner similar to what we have described above, the time spent on network contacts also does not only lead to higher costs. Instead, and in line with research results generated by Duchesneau and Gartner (1990), who observed that successful entrepreneurs spend more time on communicating with partners, we argue that investing more time on a given number of network ties will enhance the quality of relationships between nascent entrepreneurs and their network partners and thus increase the probability that they may access needed resources.

As social capital theory suggests, the mere fact of a tie or relationship between people says little about the probability that one actor will gain access to the other's resources (Adler & Kwon, 2002; Portes, 1998). Instead, a certain relationship quality is needed to motivate network members to grant access to their resources (Krackhardt, 1992; McFadyen & Cannella Jr., 2004). According to Aldrich and Reese (1993), as well as Chunyan (2005), a high degree of interaction between a focal actor and its network members is necessary to develop relationship quality. In spending time together, partners find that their relationship deepens; trust and feelings of affection for one another arise, making partners more willing to grant one another access to their resources (Krackhardt, 1992; McFadyen & Cannella Jr., 2004). However, investing time in a relationship not only influences partners' motivation to grant resource access but also makes resource exchange easier. Through repeated interactions, exchange partners develop similar knowledge stocks, shared modes of understanding and heuristics that increase interaction efficiency, especially when exchanging knowledge (McFadyen & Cannella Jr., 2004; Uzzi, 1997). As a result, obtaining the resources embedded within a network should be significantly alleviated if a nascent entrepreneur spends more time with network partners. Accordingly, we expect that investing more time in a given number of network relationships will

increase the probability that nascent entrepreneurs gain access to resources needed for creating a new venture.

Again, however, we do expect the relationship between the time that nascent entrepreneurs invest in the quality of their network relationships and the resources available to them through their network contacts to be non-linear. Although increasing the amount of time dedicated to a relationship might have a significant impact on the availability of resources when the original bond between the nascent entrepreneur and his or her network partner is weak, we expect the marginal benefits of further increasing investments in relationship quality to diminish. At some point, network partners will already be motivated enough to grant access to the resources they have so that any further time invested in relationship quality will not have an additional effect. Similar, when working routines and shared norms of understanding are well established and resource exchange is already very efficient, any additional increase relationship quality will not have a significant additional impact on the availability of resources. In aggregate, this should lead to positive but decreasing resource returns from increasing investments in relationship quality. Therefore, we propose:

> ***H2:*** *The relationship between nascent entrepreneurs' investments in relationship quality and resources granted by network partners will be positive but concave.*

2.3 Sample and Method

The data used in this study were generated especially for the purpose of analyzing the impact of network investments on resource acquisition among nascent entrepreneurs. As noted by Markman, Baron and Balkin (2005), the act of defining who is an (nascent) entrepreneur and who is not, as well as that of identifying a suitable sample, is a methodological challenge in entrepreneurship research. We tried to meet with this challenge as follows: to find enough people actively engaged in creating a new venture, we visited several business start-up exhibitions in Germany between December, 2006 and July, 2007 and gathered data from 416 individuals, who answered all of the questions relevant for our analysis.

Following the operational definition given by Davidsson and Honig (2003), we consider these individuals to be nascent entrepreneurs because they have each initiated at least one of the typical gestation activities by attending a business start-up exhibition to gather information relevant to starting a new business

venture. Moreover, 79% of the respondents have explicitly stated that they had already developed a business plan or concept at the time when the interview was conducted. Additionally, over 90% of our interviewees stated that they had already made or were sure about making a financial investment necessary for starting their new venture in the near future. As a result, even though our definition of nascent entrepreneurship is not exactly the same as the one used in the Global Entrepreneurship Monitor (Reynolds et al., 2004), we are confident that our respondents can be considered nascent entrepreneurs.

As a consequence of our approach to collecting the data for our study, the sample generated has to be considered one of convenience, which may raise issues of representativeness. We therefore analyzed the representativeness of our sample by comparing it with data from the German Socio-Economic Panel Study (GSOEP). The GSOEP is a representative household panel survey conducted annually by the German Institute for Economic Research (DIW) in Berlin and often used for research on (nascent) entrepreneurs in Germany (see, e.g., Caliendo et al., 2009; Mueller, 2006; Schäfer & Talavera, 2009) Among other detailed information, the GSOEP reveals the participants' propensity to become self-employed. To test the representativeness of our sample, we used the data set from 2006 that comprises interview data from 21,105 individuals. We limited the sample to those people who were to some extent interested in becoming self-employed in the near future and checked whether the distribution by gender, age and education matched with our data. We found a high degree of similarity between the nascent entrepreneurs in our sample and those within the GSOEP. With 59.2% of the nascent entrepreneurs in our sample being male, for example, our data match the 58.3 % observed within the GSOEP fairly well. We are therefore confident that the results of our study are representative of nascent entrepreneurs in Germany, despite our use of a convenience sample.

2.3.1 Measures

An overview summary of the dependent and explanatory variables used in our further analysis is reported in Table 2.1. To capture our theoretical concepts, we relied on self-reports on single tailor-made items. Even though this issue should be kept in mind when considering our results, we are quite confident that this approach is appropriate. First, the main concepts addressed in our study are concrete attributes, which may thus be validly measured by using single items (Bergkvist & Rossiter, 2007, 2009). Second, previous research in

entrepreneurship has yielded broad support for the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006).

Table 2.1: Variables and Operationalizations

Variables	Operationalizations
Financial Support	Do you get financial support from your network? [0=no; 1=yes]
Informational Support	Do you get informational support from your network? [0=no; 1=yes]
Other Contact Support	Do you get contact support from your network? [0=no; 1=yes]
Emotional Support	Do you get emotional support from your network? [0=no; 1=yes]
Investments in Network Size	How many contacts do you use in association with your founding project? [metric, in numbers]
Investments in Relationship Quality	How many hours per week do you spend on maintaining these contacts? [metric, in hours / total number of contacts]
Gender	Your gender? [0=female; 1=male]
Marital Status	Are you married? [0=not married; 1=married]
Age	How old are you? [metric, in years]
Education	Years of education? [metric, in years]
Prior Industry Experience.	Do you have any experience in the industry of your new firm? [0=no; 1=yes]
Prior Founding Experience/Failure	Do you have self-employment experience? If yes, was your prior business a failure? [0=no; 1=yes, failure]
Prior Founding Experience/Success	Do you have self-employment experience? If yes, was your prior business a success? [0=no; 1=yes, successful]
Necessity Entrepreneur	Are you unemployed or will you become unemployed in the near future if you do not switch into self-employment? [0=no; 1=yes]
Opportunity Entrepreneur	Do you anticipate higher earnings as an entrepreneur? [0=no; 1=yes]

We additionally checked for common method bias according to the method outlined by Podsakoff and Organ (1986) and performed a Harman's one-factor test. The results of our unrotated factor analysis show six factors with eigenvalues of more than one, with the maximum variance explained being 15.9%. We thus concluded that common method bias is not a significant issue, as no single factor accounted for the majority of the variance that emerged.

2.3.1.1 Dependent Variables

As explained in our theory section, nascent entrepreneurs' networks are an important source of financial capital, information and knowledge, emotional support and business-relevant contacts. Because we expect these resources to vary in terms of their availability and transferability within a network, we decided to measure them separately. As a result, we constructed four items and asked our respondents whether they received financial, informational, emotional or contact support from their network members. The respective resource variable took the value of one if the interviewee obtained that specific type of resource via his network contacts, and zero otherwise.

2.3.1.2 Independent Variables

To capture our network investment variables, we followed an ego-centered approach (Greve & Salaff, 2003; Knoke & Kuklinski, 1982; Stam & Elfring, 2008; Wasserman & Faust, 1994). Ego-centered network analysis explores network relationships around each sampled person only and not the total network relationships in which the individuals are embedded. Accordingly, respondents are asked to describe the characteristics of their specific networks as well as their networking activities. This form of analysis is especially appropriate for collecting data from a target population such as that of nascent entrepreneurs—that is, a small percentage of a population whose relations are not concentrated in a single social structure (Greve & Salaff, 2003).

To measure *investments in network size,* we did not follow the 'discussion network approach' that is often used in entrepreneurship research (Aldrich & Reese, 1993; Greve & Salaff, 2003). Instead, to also include contacts that are not or not only useful for discussing business matters but provide some of the other resources addressed in our study, we followed Hansen (1995) and addressed the nascent entrepreneur's 'action set', comprising all individuals who are somehow involved in setting up the nascent entrepreneur's business. Consequently, we adapted a measure constructed by Lechner, Dowling and Welpe (2006) and asked our respondents for the total number of network contacts used for setting up their business.

To measure *investments in relationship quality*, we followed Aldrich, Rosen and Woodward (1987) and Aldrich and Reese (1993) and asked our respondents to indicate their weekly amount of time spent on maintaining the aforementioned number of contacts. We then divided the total time spent by network size to include the time spent per contact in our analysis.

2.3.1.3 Controls

We included several control variables in our study that might affect the demand for or the availability of network resources or our network investment variables. First, we added *female* because men and women tend to differ with respect to the composition of their networks (Moore, 1990; Renzulli et al., 2000). Second, we included *marital status* because being married indicates that respondents have very strong social ties to a spouse who will probably be highly motivated to provide emotional support or other resources (Sanders & Nee, 1996). Third, we controlled for *age* because of two underlying effects. First, as individuals grow older, they tend to make more contacts (Renzulli et al., 2000). Second, older

individuals are also more likely to possess a higher stock of human and financial capital than are younger ones. This may reduce their overall need for external resources (Parker, 2004). Especially because of the latter argument, we decided to also include *years of education, prior self-employment experience* and *prior industry experience,* which all indicate different aspects of human capital and have shown their influence on the amount of knowledge and information needed from external sources as well as on the ability to attract external partners (Diochon et al., 2008; Mosey & Wright, 2007; Yoo, 2000). We also included two variables distinguishing the two types of entrepreneurs identified within the Global Entrepreneurship Monitor Project: the *opportunity entrepreneur*, which is someone driven to entrepreneurship by the perception of an entrepreneurial opportunity and the *necessity entrepreneur*, who is usually 'pushed' into nascent entrepreneurship by unemployment (Bosma, Acs, Autio, Coduras & Levie, 2009; Schjoedt & Shaver, 2007). With previously unemployed nascent entrepreneurs probably having fewer business-related contacts and a smaller resource base, we assume that belonging to one of these entrepreneurial types may affect both network composition and resource access. Finally, we controlled for the *economic environment* by constructing a set of dummy variables representing the five exhibitions we used for data collection.

2.3.2 Analytical Approach

Our four endogenous variables, financial, informational and emotional support and support through the provision of further business relevant contacts, are all binary, taking the value of one if a person has access to these resources and zero otherwise. We therefore considered multiple logistic regressions as the appropriate econometric model for our analysis. To test our propositions of diminishing resource returns associated with network size and networking activities within logistic regression, we followed the approach to test for non-linear effects described by Wooldridge (2009) and applied by Colombo, Grilli and Piva (2006) in entrepreneurship research and resorted to a quadratic model specification. More specifically, we included both variables as well as their respective squared values in the model and performed joint tests for significance to analyze whether the non-linear functional form of our regression models is correct.

2.4 Results

The descriptive statistics of all variables used in our study, as well as their Pearson's correlations, are provided in Table 2.2.

Table 2.2: Means, Standard Deviations and Pearson's Correlations

N = 416	M	SD	1	2	3	4	5	6	7
1. Financial Support	.48	.50	1.						
2. Informational Support	.68	.47	.34*	1.					
3. Other Contact Support	.64	.48	.23*	.48*	1.				
4. Emotional Support	.77	.42	.24*	.50*	.57*	1.			
5. Investments in Network Size	14	21	.20*	.19*	.15*	.19*	1.		
6. Invest. in Relationship Quality	.85	1.6	.02	.09	.07	.16*	-.18*	1.	
7. Gender	.61	.49	.08	.03	-.03*	-.07	.04	-.13*	1.
8. Marital Status	.33	.47	-.05	.03	.01	.08	.01	-.05	-.01
9. Age	37	9.7	-.10*	-.10*	.04	.08	-.02	.06	-.14*
10. Years of Education	15	2.6	-.05	.10*	.07	.10*	.11*	-.08	-.08
11. Industry Experience	.57	.50	.02	.10*	.10*	.06	.11*	.04	.03
12. Prior Founding Ex./Failure	.11	.32	.06	.01	.03	.05	.14*	-.05	-.01
13. Prior Founding Ex./Success	.07	.26	-.09	.02	.01	-.02	.02	-.05	-.01
14. Necessity Entrepreneur	.46	.50	-.05	-.11*	-.01	-.04	-.07	.01	-.08
15. Opportunity Entrepreneur	.58	.49	.04	-.02	.01	-.03	-.10*	.04	.10*

* Correlation is significant at the .05 level (2-tailed)

Table 2.2: Means, Standard Deviations and Pearson's Correlations (Contd.)

N = 416	8	9	10	11	12	13	14	15
1. Financial Support								
2. Informational Support								
3. Other Contact Support								
4. Emotional Support								
5. Investments in Network Size								
6. Invest.in Relationship Quality								
7. Gender								
8. Marital Status	1							
9. Age	.38*	1						
10. Years of Education	-.01	.13*	1					
11. Industry Experience	.01	.05	-.02	1				
12. Prior Founding Exp./Failure	.05	.07	.08	.14*	1			
13. Prior Founding Exp./Success	.09	.06	-.11*	.17*	-.10*	1		
14. Necessity Entrepreneur	.08	.31*	-.11*	.01	-.04	-.11*	1	
15. Opportunity Entrepreneur	-.16*	-.22*	-.11*	.01	.01	-.01	-.04	1

* Correlation is significant at the .05 level (2-tailed)

Our average nascent entrepreneur has a network with 14 contacts and spends a considerable amount of time, namely, .85 hours per week, maintaining each

network contact. Around 48% of our respondents are provided with financial resources for their founding project by their networks' members, 68% receive informational support, 64% obtain other contact support and 77% agree that they receive emotional support from their network contacts. The correlation matrix additionally reveals that resource availability is significantly correlated with investments in network size and—to a lesser degree—with investments in relationship quality and several of our control variables, such as age, education and industry-specific experience. As our independent variables are only moderately correlated, multicollinearity is not an issue in our study.

Table 2.3: Logit Estimation Results

***N* = 416**	**Model 1** **Financial Support**	**Model 2** **Informational Support**	**Model 3** **Contact Support**	**Model 4** **Emotional Support**
Constant	.560 (0.67)	-.668 (-0.74)	-.333 (-0.39)	-.932 (-0.89)
Gender	.380^{+} (1.68)	.177 (0.72)	-.142 (-0.61)	-.305 (-1.03)
Marital Status	-.0376 (-0.15)	.524^{+} (1.89)	.232 (0.91)	.504 (1.52)
Age	-.0171 (-1.30)	-.0383** (-2.66)	-.0234^{+} (-1.74)	.00885 (0.52)
Years of Education	-.0793^{+} (-1.84)	.0787^{+} (1.69)	.0448 (1.02)	.0269 (0.50)
Prior Industry Experience	-.0215 (-0.09)	.306 (1.23)	.245 (1.05)	-.0300 (-0.10)
Prior Founding Experience/Failure	.153 (0.44)	-.260 (-0.68)	.0885 (0.24)	.0302 (0.06)
Prior Founding Experience/Success	-.903* (-2.00)	.0818 (0.17)	-.0707 (-0.16)	-.423 (-0.81)
Necessity Entrepreneur	.00327 (0.01)	-.343 (-1.39)	.145 (0.62)	-.388 (-1.32)
Opportunity Entrepreneur	.0653 (0.29)	-.133 (-0.55)	.0498 (0.22)	-.0336 (-0.12)
Investments in Network Size	.0545** (4.42)	.0750** (4.93)	.0619** (4.42)	.119** (5.31)
Investments in Network Size^2	-.000236** (-2.60)	-.000381** (-3.82)	-.000352** (-3.07)	-.000580** (-4.63)
Investments in Relationship Quality	.719** (3.92)	.886** (4.59)	.628** (3.74)	1.245** (4.66)
Investments in Relationship Quality^2	-.0746** (-3.02)	-.0591** (-3.90)	-.0422** (-3.05)	-.0766** (-3.59)
LR-Chi² Test	64.22***	77.88***	49.07***	100.33***
Pseudo R^2	.109	.145	.088	.219

t statistics in parentheses; $^{+}$ $p < .10$, * $p < .05$, ** $p < .01$; all regressions include dummies indicating economic environment

Table 2.3 displays the results of our logistic regressions, which predict the access to financial, informational, contact and emotional support as a function of investments in network size and relationship quality as well as our control variables. As a *LR-Chi²* test reveals, all of our models are significant.

With regard to the control variables, our results show that married people have a higher probability of achieving informational support. The effect of age on resource access is negative and statistically significant at a conventional level for both informational and other contact support. Additionally, our human capital variables have a significant influence on access to informational and financial support. We finally see that nascent entrepreneurs who have failed with their former businesses are less likely to receive financial support.

With respect to our hypotheses, our results show the expected effects. As proposed, the coefficients of investments in network size and relationship quality are positive, whereas the coefficients of the squared values are negative, which indicates a concave relationship.

A joint test of significance further reveals that our non-linear specifications of the regression models are correct: the null hypothesis that the coefficients of the squared network variables are jointly equal to null in models 1-4 is rejected at conventional significance levels by a Wald X^2 test (X^2 (2) = 15.17, 30.2, 19.6 and 37.69, respectively). This means that, as stated by hypothesis 1, the probability of achieving access to financial, informational, contact or emotional support increases at a decreasing rate with investments in network size. Quite similarly and confirming our second hypothesis, the probability of gaining access to relevant start-up resources addressed also increases at a decreasing rate, when nascent entrepreneurs raise their investments in relationship quality.

To provide a better impression of how the returns on network investments vary with the type of resource analyzed, we plotted the predicted probabilities for the network variables for each regression model separately. Noting that the estimated probabilities in a non-linear model strongly depend on the contribution of the other covariates (Long & Freese, 2005; Mitchell & Chen, 2005), we estimated three different sets of predicted probabilities to test the robustness of our results. Specifically, we estimated the predicted probabilities for (1) an 'average' nascent entrepreneur in our sample by setting all control variables at their means (Type A), (2) a single female nascent entrepreneur without prior founding and industry-specific experience who is 'pushed' into self-employment (Type B) and (3) a married male with experience in successfully founding a new venture and industry experience who is 'pulled' into founding a new business (Type C). Figures 2.1, 2.2 and 2.3 show the results.

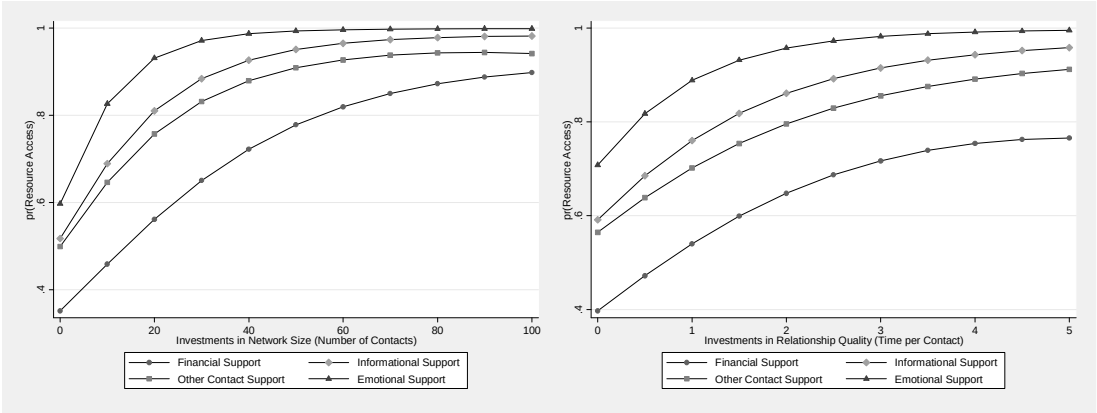

Figure 2.1: Network Investments and Resource Access for Type A

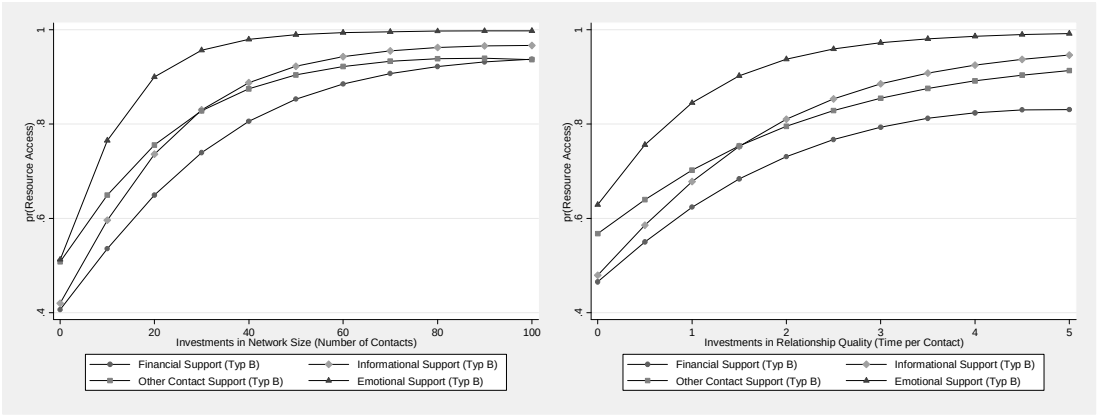

Figure 2.2: Network Investments and Resource Access for Type B

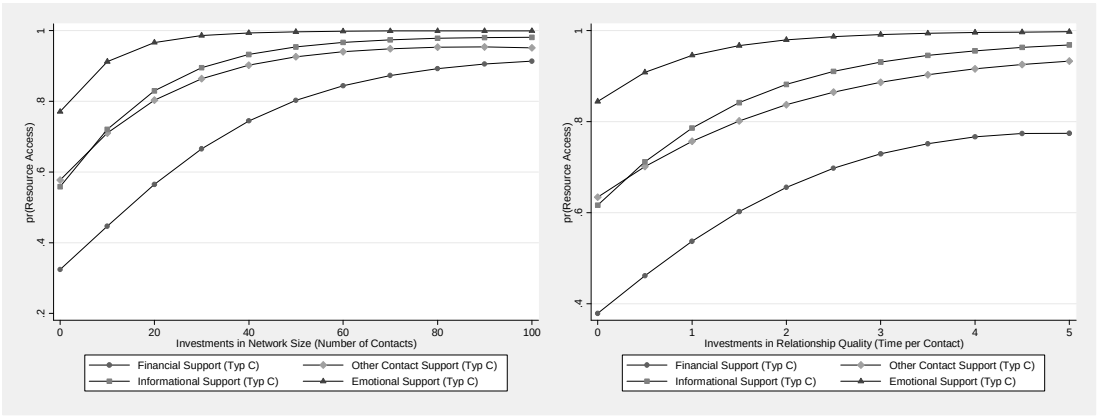

Figure 2.3: Network Investments and Resource Access for Type C

All three figures reveal a positive but concave relationship between network investments and access to every type of resource analyzed. This proves that our results are robust and provides additional support for our hypotheses stating that investments in network size and relationship quality lead to diminishing marginal resource returns. Whereas the slopes describing the relationships between network investments and resource access do only slightly differ with the type of

nascent entrepreneur analyzed, Figures 2.1, 2.2 and 2.3 also show that the slopes describing the access to different types of resources differ significantly. While emotional support, for example, seems to be quite easy to obtain, many more network investments are needed to gain access to business contacts and financial support seems to be the most difficult to obtain.

2.5 Discussion

Social capital theory and network research in entrepreneurship both suggest that nascent entrepreneurs may profit from network relationships because they provide access to resources necessary for founding a new business to favorable conditions. Additionally, theoretical treaties and recent research results point to the fact that keeping network relationships that provide access to resources also cause opportunity costs in time. Based on these insights, maintaining extensive networks with relationships of the quality needed to gain access to valuable resources is an investment, which raises the question if and how such an investment may pay off.

With the study at hand, we aimed to contribute to answering this question by investigating the effects of two different types of network investments—namely, investments in network size and investments in relationship quality—on resource access granted by the network. More specifically, we derived the hypotheses that nascent entrepreneurs will gain positive but diminishing marginal resource returns from increasing investments in network size and relationship quality. Our empirical study, based on a sample of 416 German nascent entrepreneurs, provides confirming evidence for both of our propositions. The results first show that investments in network size increase nascent entrepreneurs' opportunities to leverage resources such as financial capital, information and emotional and contact support through their network. This means that, as proposed by social capital theory, maintaining larger networks indeed increases the probability that nascent entrepreneurs may access the resources needed through their network. However, our results also show that the likelihood of gaining access to resources increases at a decreasing rate with the number of contacts maintained, meaning that additional investments in network size lead to diminishing resource returns. This supports the reasoning that the probability of adding additional ties with resources not previously available to a nascent entrepreneur decreases with network size.

Analogously, our results also provide support for the proposition, that investments in relationship quality, which entail dedicating more time to every

single network relationship, positively influences resource access. These results underscore the idea that exchange partners' spending time together fosters trust, the existence of common goals and mutual understanding as well as the efficiency of resource exchange. But again, our results show that the marginal effects of increasing investments in relationship quality are diminishing. This result confirms the argument that there is a point in every relationship at which a further increase in the time invested in a relationship will not have a significant further impact on exchange efficiency or a partner's motivation to grant resource access.

In sum, these results provide a partial explanation for an inverted U-shaped relationship between networking and new venture performance observed by Watson (2007) in the field of established ventures. His reasoning for this shape of the curve is mainly based on the argument that beyond some limit, the marginal benefits from networking will be more than offset by network costs. Our results provide support for and specify this argument. They show that even if the indirect or opportunity costs of networking stemming from an entrepreneur's lack of time available to attend to other business affairs are linear, the overall effect of the time invested in networks will turn negative because of diminishing marginal benefits in terms of resource access.

Additionally, our results show that the resource returns stemming from network investments vary significantly with resource type. While the access to some resources such as emotional support is highly probable, even when a nascent entrepreneur bears only a very limited amount of network investments, more extensive networks and more time invested in every single relationship are necessary to gain access to financial or contact support.

An explanation for these differences in resource returns may be provided by adopting a dynamic perspective of the nascent entrepreneur's network development. As previously outlined in detail, individuals who are engaged in setting up on their own are confronted with new tasks and challenges. To overcome these challenges, most nascent entrepreneurs have to acquire additional resources. In the very beginning of the entrepreneurial process, however, their network will usually be comprised of relatives, friends and acquaintances (Hite & Hesterly, 2001). While these network partners will most probably be able and willing to offer emotional support, the probability that they will also be able to provide access to more founding-specific resources, such as market information and knowledge or contacts among potential suppliers and customers, will be much lower. Consequently, nascent entrepreneurs, who need resources that are only necessary when founding a new venture, such as specific

knowledge or additional business contacts, will have to adjust their network (Lechner & Dowling, 2003; Witt, 2004). However, adjusting a network in turn means that additional investments in extending a network's size and establishing relationships of the quality needed to gain resource access are needed.

The observation of different resource-specific relationships between network investments and resource access may, however, also be explained from a network partner's perspective. From that point of view, granting resource access to a nascent entrepreneur comes along with certain costs that differ by resource type. While providing access to emotional or even informational support is, despite the time investment necessary, almost cost-free for network partners, supporting a nascent entrepreneur with contacts or financial capital is much more expensive. In the case of financial capital, these expenses are quite apparent. However, contact support also comes along with certain costs. According to Burt (1992), contact mediation always means giving up a bridging position and thus the opportunity to "profit from being between others" (p. 79). Additionally, there are reputational risks involved when contacts are mediated, as the contact broker is typically made responsible when a new contact turns out not to be as reliable or trustworthy as expected (Coleman, 1988; Gulati & Gargiulo, 1999). Even though both explanations given bear certain face validity, we are not able to empirically test whether the first or second reasoning or maybe even both hold using the data available in our study. Therefore, we would like to encourage further research to address this question and analyze whether the first and or the second argument given may at least partially explain the different effects of nascent entrepreneurs' network investments on the access to different kinds of resources.

2.6 Conclusion and limitations

The purpose of the study at hand was to shed light on the question of how network investments pay off. More specifically, we investigated the effects of nascent entrepreneurs' investments in network size and relationship intensity on their access to start-up-relevant resources. Our findings indicate that there are positive but diminishing resource returns stemming from both types of network investments.

Considering this result, we see our study's contribution as follows: we first contribute to network research in the field of entrepreneurship by directly addressing the access to different kinds of resources as an endogenous variable in a quantitative study, which has—to the best of our knowledge—not been done before. We additionally contribute to network theory in the field by providing

theoretical reasoning and empirical evidence for the proposition that increasing network investments lead to diminishing marginal resource returns. In specifying how network investments pay off, we complement previous research and provide a partial explanation for an inverted U-shaped relationship between networking activities and entrepreneurial success, which has previously been observed by Watson (2007) in the field of established ventures. Furthermore, we show that the amount of network investments necessary for accessing resources varies significantly with the type of resource needed and provides two possible explanations for this effect, which should be addressed by further research.

Our results also bear some practical implications. According to the results presented, nascent entrepreneurs should indeed invest time and energy into building and maintaining a network if they need access to resources such as financial capital, knowledge and information as well as additional contacts and emotional support. However, when doing so, they should keep in mind that increasing network investments leads to diminishing returns, which may beyond some limit be outweighed by the costs that come along. For finding the 'optimal' level of network investments, our results further suggest that nascent entrepreneurs should take into account the type of resource they need. Compared to a situation in which only emotional support is needed, they should invest more time and energy when additional financial capital or business contacts are necessary.

Finally, we note some limitations of our study. First of all, we gathered data only on the average amount of time spent by entrepreneurs on their network relationships. Therefore, we are not able to identify how much time they actually dedicate to a specific network contact. Some of our respondents may have distributed their time equally among their network partners; others may have concentrated a great percentage of their time on only a few network members. Consequently, the conclusion that there is a concave relationship between investments in relationship quality and resource returns gained from a single relationship may be challenged. What we can infer from our results, however, is that investing additional time on a fixed number of contacts leads to diminishing returns in terms of the access to the resources addressed.

We also note that our analysis is based on self-reported measures. However, as we have already described above, previous research supports the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006), and as there are almost no objective data available on nascent entrepreneurs and their networks, this approach seemed to be the only one feasible.

Chapter 3

The Two Sides of the Story: Network Investments and New Venture Creation

3.1 Introduction

Over the past decade, entrepreneurship research has made a considerable effort to understand the factors influencing success in new venture creation and development. Representing one factor that figures prominently in this stream of research are social networks (Street & Cameron, 2007). Focusing on the relationship between networks and founding success, previous research provides evidence that network characteristics such as the size and the quality of relationships are positively and significantly associated with founding progress and early start-up success (Aldrich et al., 1987; Brüderl & Preisendorfer, 1998; Davidsson & Honig, 2003; Hansen, 1995; Renzulli et al., 2000). The rationale given for these findings is a rather simple one: entrepreneurs are seen as gaining valuable and necessary resources through their networks (Batjargal, 2003; Liao & Welsch, 2005). In fact, some authors even describe networks as the foremost and fundamental source of the information and resource support needed to successfully start a new venture (Yoo, 2000).

However, recent research in the field also points out that the relationship between the aforementioned network variables and entrepreneurial success might not be as simple as expected. First of all, there are some studies in the field finding no significant effect of the aforementioned network variables on founding success and subsequent new venture performance (Aldrich et al., 1987; Hoang & Antoncic, 2003). Second, and in line with theoretical treaties highlighting that maintaining network relationships comes along with certain costs (Ebers & Grandori, 1997; Johannisson, 1996; Witt, 2004), recent research provides first empirical evidence for the notion of positive and negative effects of networking activities. In particular, Watson (2007) shows that the relationship between the frequency with which new venture owners seek advice from their network and firm survival as well as growth may be best described by an inverted U-shaped relationship. Finally, a most recent study directly focusing on nascent entrepreneurs indicates that the resource returns in terms of access to financial, informational, emotional and contact support that nascent entrepreneurs receive

from enlarging their networks and intensifying relationships are diminishing (Semrau & Werner, 2009).

Based on these insights, we argue that both maintaining a larger network and dedicating more time to every single relationship within a network are investments that do not always pay off for nascent entrepreneurs. More specifically, we propose that diminishing resource returns and the costs coming along with network relationships cause the relationship between 1) investments in network size and founding success and 2) investments in relationship quality and founding success to have an inverted U-shape.

We test these hypotheses using longitudinal data from 137 nascent entrepreneurs in Germany and find broad support for our hypotheses. Up to a certain point, the impact of investments in network size and relationship intensity is positive but diminishing. However, when a certain threshold is realized, additionally increasing network investments has a negative effect on the probability of successfully founding a new venture.

Considering these results, we see the contribution of this study as follows: we contribute to network theory in the field of nascent entrepreneurship by developing an explanation for an inverted U-shaped relationship between nascent entrepreneurs' network investments and founding success that is based on two different effects—positive but diminishing resource returns and opportunity costs of time. In providing empirical evidence for the proposed curvilinear relationship, we additionally confirm and complement previous research results showing diminishing marginal resource returns on nascent entrepreneurs' network investments.

These insights do also offer practical implications for nascent entrepreneurs, who should strategically decide to invest enough time in the size of and relationships within their network to get access to the resources they need but must be careful not to invest too much and neglect other important tasks necessary to successfully found a new venture.

The rest of the chapter is organized as follows. In the next section, we develop our hypotheses. In section 3.3, we then continue with describing our research method and data before presenting the results of our study in section 3.4, which we discuss in section 3.5 We finally draw our conclusions and report some limitations of the study at hand in section 3.6.

3.2 Theory and Hypotheses

According to Reynolds et al. (2004), the process of founding a new venture can be described as having three different stages with two major transitions—conception and firm birth—in between them. Within the model, the first transition is triggered when individuals not only think about trying to start a new business but also engage in activities to help them reach that objective. If an individual has not yet succeeded in making the transition of firm birth, he or she is called a nascent entrepreneur (Aldrich, 1999; Carter et al., 1996; Reynolds et al., 2004).

To successfully master the second transition and start operating a new venture, nascent entrepreneurs have to fulfill many different tasks, such as writing a convincing business plan, developing their first product models or prototypes, creating a legal identity, organizing a start-up team and many more (Aldrich, 1999; Carter et al., 1996; Liao & Welsch, 2005; Reynolds et al., 2004). To meet the requirements associated with these challenges, nascent entrepreneurs face two major tasks—they must gather the different tangible and intangible resources needed and combine these resources to realize the desired outputs (Carter et al., 1996; Ucbasaran et al., 2001).

The relevance of networks for fulfilling the first of these major tasks and gather the resources necessary for founding a new venture has been widely recognized. As described by several researchers in the field, nascent entrepreneurs usually do not possess all the many different resources needed to successfully found a new venture in sufficient quality and quantity (Aldrich, 1999; Bowey & Easton, 2007; Starr & Macmillan, 1990). They consequently have to mobilize the missing resources, and social networks are their major source to do so (Greve & Salaff, 2003; Hanlon & Saunders, 2007; Yoo, 2000). As posited in entrepreneurship theory and research, the variety of support nascent entrepreneurs mobilize through their networks is considerable and includes physical resources, financial capital as well as knowledge and information, emotional support and the intermediation of important contacts to potential customers, suppliers and so on (Aldrich, 1999; Hanlon & Saunders, 2007; Liao & Welsch, 2005; Reynolds, 2007; Yoo, 2000).

Even though networks of social contacts are seen as the primary source of resource support for successfully founding a new venture, one has to keep in mind that the mere existence of a network with general social contacts does not necessarily mean that a nascent entrepreneur gets access to the resources he or she needs. As social capital theorists propose, network variables like the size of

the network and the quality of relationships between a nascent entrepreneur and the members of his or her network significantly influence the amount of resources he or she achieves through network contacts (Batjargal, 2003; Burt, 1992; Liao & Welsch, 2005; Stam & Elfring, 2008).

Additionally, several researchers point to the fact that maintaining networks is not all positive. Instead, according to Ebers and Grandori (1997) or Witt (2004), two types of costs associated with network relationships have to be considered. First, there are direct costs stemming from the need to offer resources in exchange for those obtained from network partners. Second, there are indirect costs stemming from the time spent on maintaining network relationships. While direct costs can be seen as the price for obtaining specific resources via network exchange, which is usually still more favorable than that realized in market relationships (Uzzi, 1999; Uzzi & Lancaster, 2004), the indirect or opportunity costs make networking an investment for nascent entrepreneurs. To establish and maintain network relationships that are useful in terms of potentially providing resources crucial for founding a new venture to favorable conditions, nascent entrepreneurs have to invest time and energy. This action negatively impacts nascent entrepreneurs' time available for other important business affairs, such as combining the resources gathered, and will thus impede their progress in founding a new venture.

Based on the effects described, we now argue that spending time to maintain network relationships is an investment and develop detailed hypotheses on why two types of network investments—investments in network size and investments in relationship quality—are only to some extent beneficial for nascent entrepreneurs trying to found their new venture.

3.2.1 Investments in Network Size and Founding Success

According to Nahapiet and Ghoshal (1998), the "fundamental proposition of social capital theory" (p. 252) is that network relationships provide access to resources. Accordingly, larger networks comprising more people will enhance a nascent entrepreneur's opportunities to leverage resources (Adler and Kwon 2002). However, not only the mere quantity of resources accessible is affected by network size. As people differ not only in what and whom they know but also in their endowment with financial capital and other physical assets, the probability of including complementary resources to a network when adding a new tie is considerable, even when nascent entrepreneurs are not strategically seeking new network partners according to their resource needs. Consequently, extending an

existing network typically increases not only the mere quantity but also the variety of resources available. In turn, the probability that a nascent entrepreneur may access a specific resource when needed increases with the size of his or her network (Batjargal, 2003). As a consequence, a nascent entrepreneur's chance to access the resources he needs to succeed in founding a new business in sufficient quantity should increase with the size of his or her network (Hansen et al., 2001; Liao & Welsch, 2003).

Even though this implies a positive relationship between the number of network partners and resource access, we do not expect that the total impact of network size on founding a successful relationship is also positive. First of all, and in line with previous research results, we propose that nascent entrepreneurs' resource access should increase with network size at a decreasing rate (Semrau & Werner, 2009). While adding more partners to a small network will significantly increase the amount and variety of available resources, such an increase, following the principle of diminishing returns, is far less likely when the network is already large (Deeds & Hill, 1996).

Second, as outlined above, the indirect costs incurred in extending a network have to be taken into account. To obtain resources to favorable conditions from network contacts, nascent entrepreneurs have to invest time and energy to build and maintain a relationship of certain quality (Hansen et al., 2001; Witt, 2004). While this will increase the availability of resources needed and contribute to fulfilling the first major task for successfully founding a new business, it may hinder accomplishing the second one. As outlined above, externally acquired resources as well as those originally held by a nascent entrepreneur are only ingredients, which have to be combined to succeed in writing a business plan, creating a legal identity, developing a product and marketing it and thus start a new venture (Carter et al., 1996; Ucbasaran et al., 2001). With the amount of time nascent entrepreneurs have to spend on every single relationship—which we will address as a variable in the next section—kept constant, extending network size means that nascent entrepreneurs have less time to attend to the task of combining the resources gathered, which is equally necessary for business creation.

Combining the arguments described above, we expect that the decreasing resource returns of extending network size are, beyond some limit, more than offset by the negative impact of the nascent entrepreneur's lack of time available. Consequently, we expect the relationship between nascent entrepreneurs' investments in network size and founding success to have an inverted U-shape. We thus propose:

***H1**: There is an inverted U-shaped relationship between nascent entrepreneurs' investments in network size and their success in founding a new venture.*

3.2.2 Investments in relationship quality and founding success

As described above, the total amount of time people spend on maintaining their network relationships varies with the number of contacts. Another factor influencing this total time is the time spent on every relationship within the network (Greve, 1995). Following Aldrich and Reese (1993) as well as Chell and Bains (2000), we argue that this variable is also worth examination when analyzing the impact of network investments on founding success.

Conversely to what we have described above, the time spent per contact directly represents the time a nascent entrepreneur spends on maintaining his or her network when keeping network size constant. Consequently, the indirect costs of networks, representing the time during which a nascent entrepreneur cannot attend to other tasks necessary for founding a new venture, will directly increase with the time spent on every single network relationship. However, in a manner similar to what we have described above, the time spent on network contacts may also lead to higher network benefits. In line with the observation that successful entrepreneurs spend more time on communicating with partners (Duchesneau & Gartner, 1990), we argue that the time spent on network ties will strengthen a relationship and therefore increase the probability that a nascent entrepreneur will access the resources he needs.

As social capital theory suggests, the mere fact of a tie or relationship between people says little about the probability that one actor will get access to the other's resources (Adler & Kwon, 2002; Portes, 1998). Instead, a certain relationship quality is needed to motivate network members to grant resource access (Krackhardt, 1992; McFadyen & Cannella Jr., 2004). According to Aldrich and Reese (1993), as well as Chunyan (2005), a high degree of interaction frequency and interaction intensity between a focal actor and his or her network members is necessary to develop relationships that provide access to needed resources. In spending time together, partners find that their relationship deepens; trust and feelings of affection for one another arise, making partners more willing to grant one another access to their resources (Krackhardt, 1992; McFadyen & Cannella Jr., 2004).

However, investing time in a relationship not only influences the network contact's motivation to grant resource access but also makes exchanging

resources, such as information and knowledge, more efficient. Through repeated interactions, exchange partners develop similar knowledge stocks, shared modes of understanding and heuristics that increase interaction efficiency, especially when exchanging knowledge (McFadyen & Cannella Jr., 2004; Uzzi, 1997). As a result, obtaining resources embedded within a network should be much easier for a nascent entrepreneur when he or she spends more time with network partners. Accordingly, we expect that investing more time in every single relationship—while keeping the number of contacts constant—will increase a nascent entrepreneurs' access to resources via his network contacts.

Again, however, we do not expect a linear effect of increasing the time invested in relationship quality on resource availability. Although increasing the time invested will have a significant impact on the availability of resources when the original amount of time spent is small, we expect the marginal benefits of this investment to diminish. At some point, external partners will be motivated enough to grant access to the resources needed by a nascent entrepreneur, so that any further time investments will not have an additional effect. Similarly, when working routines and shared norms of understanding are well established and resource exchange is already very efficient, an additional increase in time spent will not have a similar significant impact. In sum, and in line with the results provided by previous research (Semrau & Werner, 2009), this should lead to positive but diminishing resource returns of increasing the time invested in relationship quality.

Combining the cost and benefit effects of increasing investments in relationship quality, we expect their returns to be beyond some limit more than offset by the negative impact of the nascent entrepreneur's lack of time available to attend other important tasks. Consequently, we also expect the relationship between the time nascent entrepreneurs spend on every relationship within their network and their success in founding a new venture to have an inverted U-shape. We thus propose:

> ***H2:*** *There is an inverted U-shaped relationship between a nascent entrepreneur's networking activity and his or her success in founding a new venture.*

3.3 Data and Method

As noted by Markman, Baron and Balkin (2005), identifying a suitable sample is a methodological challenge in entrepreneurship research. We tried to meet with this challenge as follows: to find enough individuals actively engaged in creating

a new venture, we visited several business start-up exhibitions in Germany between December 2006 and July 2007 and gathered data from 416 individuals interested in founding a new venture. We then contacted those respondents, who explicitly allowed us to do so in the first interview, again one year later. In this second interview, we asked them, among several other questions, if they succeeded in founding a new venture. As a result, we received longitudinal data of 137 respondents who answered all of our questions in both interviews.

Following the operational definition given by Davidsson and Honig (2003), we consider these 137 individuals to have been nascent entrepreneurs when the first interview was conducted because they had each initiated at least one of the typical gestation activities by attending a business start-up exhibition to gather information relevant to starting a new business venture. Additionally, 88% of the respondents explicitly stated in the first interview that they had already developed a business plan or concept, and over 95% said that they had already made or were certain about making a financial investment necessary for starting their new venture in the near future. Therefore, even though our definition of nascent entrepreneurship is not exactly the same as that used in the Global Entrepreneurship Monitor (Reynolds et al., 2004), we are confident that our respondents could be considered nascent entrepreneurs when they were interviewed in the first place.

As a consequence of our approach to collecting the data used in our study, the sample generated has to be considered one of convenience, which may raise issues of representativeness. We therefore first checked for non-response bias by comparing the 137 individuals who answered all our questions in both interviews with those who only participated in the first one. We then analyzed the representativeness of our sample by comparing it with data from the German Socio-Economic Panel Study (GSOEP). The GSOEP is a representative household panel survey conducted annually by the German Institute for Economic Research (DIW) in Berlin and often used for research on German (nascent) entrepreneurs (Caliendo et al., 2009; Mueller, 2006; Schäfer & Talavera, 2009). Among other detailed information, the GSOEP reveals the participants' propensity to become self-employed. To test the representativeness of our sample, we used the data from 2006, which are comprised of interviews with 21,105 individuals. We limited the sample to those people who were to some extent interested in becoming self-employed in the near future and checked whether the distribution by gender, age and education matched with our data. We found a high degree of similarity between the nascent entrepreneurs in our sample and those within the GSOEP.

3.3.1 Measures

As the main concepts focused on in our study are concrete attributes, we followed Bergkvist and Rossiter (2007, 2009) and constructed tailor-made single items to capture our concepts. An overview of the variables and items used in the further analysis is reported in Table 3.1. As Table 3.1 shows, we captured our theoretical concepts relying on self-reports. Although we are aware that this should be kept in mind, when considering our results, we are quite confident that this approach is appropriate.

Table 3.1: Variables and Operationalizations

Variables	Operationalizations
Founding Success	Have you succeeded in founding your new business? [0=no; 1=yes]
Investments in Network Size	How many contacts do you use in association with your founding project? [metric, in numbers]
Investments in Relationship Quality	How many hours per week do you spend on maintaining these contacts? [metric, in hours / total number of contacts]
Gender	Your gender? [0=female; 1=male]
Age	How old are you? [metric, in years]
Education	Years of education? [metric, in years]
Migrant	Are you a German citizen? [0=yes; 1=no]
Prior Founding Experience/Failure	Do you have self-employment experience? If yes, was your prior business a failure? [0=no; 1=yes, failure]
Prior Founding Experience/Success	Do you have self-employment experience? If yes, was your prior business a success? [0=no; 1=yes, successful]
Family Support	Do you get support for your founding project from your family? [0=no; 1=yes]
Support Former Employer	Do you get support for your founding project from your former employer? [0=no; 1=yes]
Full-Time Ambition	Do you plan to become self-employed on a full-time basis? [0=no; 1=yes]
Innovative Product/Service	Are you going to offer 'innovative' or 'traditional' products/services to your clients when the business is founded? [0=traditional; 1=innovative]

First of all, previous research in entrepreneurship has yielded broad support for the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006). Additionally, we checked for common method bias by performing a Harman's one-factor test, in accordance with Podsakoff and Organ (1986). The results of our unrotated factor analysis show six factors with eigenvalues of more than one, with the maximum variance explained being 10.4%. We thus concluded that common method bias is not a significant issue because no single factor accounts for the majority of the variance that emerged.

3.3.1.1 Dependent Variable

The aim of the study at hand is to explore the relationship between nascent entrepreneurs' network investments and their success. According to the process

model of new venture creation described in the theory section, nascent entrepreneurs are individuals in the gestation phase of the entrepreneurial process, meaning that they not only think about starting a new venture but also are actively engaged in activities to reach this objective (Aldrich, 1999; Carter et al., 1996; Reynolds et al., 2004). Within this framework, success means that a nascent entrepreneur leaves the gestation phase of entrepreneurships by mastering the transition of organizational birth (Reynolds et al., 2004; Reynolds & Miller, 1992). Therefore, although starting operations is no guarantee of later success, success in the gestation phase of entrepreneurship means that a new company emerges (Aldrich et al., 1987). To capture *founding success* during the follow-up interview, we therefore asked our respondents to indicate whether they had actually succeeded in founding a new venture between the first and the second interview.

3.3.1.2 Independent Variables

To capture network investments, we followed the egocentric network approach (Knoke & Kuklinski, 1982; Wasserman & Faust, 1994). Egocentric network analysis explores network relationships around each sampled person only and not the total network relationships in which the individuals are embedded. Accordingly, respondents are asked to describe their networks and network-related activities. This form of analysis is especially appropriate for collecting data from a target population like that of nascent entrepreneurs, that is, a small percentage of a population whose relations are not concentrated in a single social structure (Greve & Salaff, 2003).

To measure *investments in network size,* we did not follow the 'discussion network approach' that is often used in entrepreneurship research (Aldrich & Reese, 1993; Greve & Salaff, 2003). Instead, to include contacts that may not be useful in discussing business matters but that do provide other start-up relevant resources such as financial capital, physical assets or emotional support, we followed Hansen (1995) and asked nascent entrepreneurs for their 'action set', that is, the complete subset of individuals who are somehow used for setting up the nascent entrepreneur's business. Consequently, we adapted a measure constructed by Lechner et al. (2006) and asked our respondents to indicate the total number of network relationships they use for setting up their new business. To measure *investments in relationship quality*, we followed Aldrich, Rosen and Woodward (1987) and Aldrich and Reese (1993) and asked our respondents to indicate how much time they spent on maintaining these aforementioned

contacts. We then divided the total time spent by network size to include the average time spent per contact in our model.

3.3.1.3 Controls

We included several control variables in our study that might affect nascent entrepreneurs' networks and success in founding a new venture. We first included some person-related variables. We added *female* because men and women tend to differ with respect to the composition of their networks as well as their founding propensity (Langowitz & Minniti, 2007; Moore, 1990; Renzulli et al., 2000). We controlled for *age* for several reasons. First, as individuals get older, they tend to have more contacts (Renzulli et al., 2000). Second, empirical evidence shows that younger individuals are more likely to start a new firm than older ones (Lévesque & Minniti, 2006). However, given that older individuals are more likely to possess a higher stock of resources necessary for founding a new venture (Parker, 2004), we expect the relationship between age and founding success to be non-linear and thus include not only age but also the squared term of age. We additionally included *years of education* and two dummies for *prior self-employment experience,* which indicate different aspects of human capital and have shown their influence on the amount of knowledge and information needed from external sources as well as on the ability to attract external partners (Diochon et al., 2008; Mosey & Wright, 2007; Yoo, 2000). To control for the high entrepreneurship rate of migrants in Europe (Baycan-Levent & Kundak, 2009) and the special conditions they face when trying to start a new venture in Germany (Kontos, 2003), we also included a dummy variable indicating respondents' *migrant background*.

Second, we included different variables capturing aspects of the respective nascent entrepreneur's founding situation. To provide an indicator for resource constraints with which a nascent entrepreneur is confronted when trying to found his new venture, we controlled for the *amount of dept capital needed* indicated in several distinct categories. We also controlled for nascent entrepreneurs *economic environment* by constructing a set of dummy variables representing the five exhibitions we used for data collection. Moreover, we included two variables indicating whether a nascent entrepreneur receives support from two specific kinds of network ties—*support granted by family members* and *support granted by the former employer*—to control for differences in the resource bases available to nascent entrepreneurs (Sanders & Nee, 1996; Yoo, 2000).

Finally, we controlled for two aspects of the founding projects of nascent entrepreneurs. We first included a variable indicating whether the nascent entrepreneur had the *ambition to become self-employed on a full-time basis* when the first interview was conducted. Second, and to control for the potential network differences reported in prior research (Rosenkopf & Schilling, 2007), we included a dummy indicating whether a nascent entrepreneur is trying to start an *innovative business*.

3.3.2 Analytical Approach

Because founding success, our dependent variable, is binary, taking the value of one if a person has succeeded in founding a new venture and zero otherwise, we considered multiple probit regressions as the appropriate econometric model for our analysis. To test our propositions of an inverted U-shaped relationship between networking investments and founding success, we followed the approach described by Wooldridge (2009) and applied by Colombo, Grilli and Piva (2006) in entrepreneurship research and resorted to a quadratic model specification. More specifically, we included both our explanatory variables as well as their respective squared values in the model and performed joint tests of significance to test our hypotheses.

3.4 Results

The means and standard deviations of all variables included in the econometric models, as well as their correlations, are presented in Table 3.2 When the first interview was conducted, the 137 nascent entrepreneurs in our sample had networks with an average of 14 contacts and spent a considerable amount of time, namely, 0.68 hours per week on average, on maintaining each network relationship. Up to the second interview, 71 of these nascent entrepreneurs—representing 51.8% of the total—succeeded in founding a new venture. As Table 3.2 reveals, no significant correlation between founding success and our explanatory variables could be observed. In line with our hypothesis, this indicates that a linear relationship between these variables is rather improbable. Table 3.2 further shows a significant negative correlation between our network investments variables (r = -.27; p < .05), meaning that people with larger networks typically invest less time in every single network relationship. As the correlation between the two explanatory variables is only of moderate size, multicollinearity is no issue in our study.

Table 3.2: Means, Standard Deviations and Pearson's Correlations

N = 137	M	SD	1	2	3	4	5	6
1. Founding Success	.52	.50	1					
2. Investments in Network Size	14.36	20.10	,12	1				
3. Investments in Relationship Quality	.68	.71	.02	-.27*	1			
4. Gender	.53	.50	-.10	-.07	-.04	1		
5. Age	40.89	9.24	-.06	.10	-.03	.07	1	
6. Years of Education	15.75	2.55	.00	.12	-.19*	-.16	.17*	1
7. Migration Background	.11	.31	.01	-.09	.11	.01	-.22*	-.14
8. Prior Founding Experience/Failure	.10	.30	.11	.06	-.04	.18*	-.01	-.28*
9. Prior Founding Experience/Success	.17	.38	.00	.26*	-.09	-.12	.11	.08
10. Family Support	.94	.24	.07	.17*	.20*	-.05	.01	.18*
11. Support Former Employer	.50	.50	.02	.18*	-.02	.02	-.02	.15
12. Full-Time Ambition	.72	.45	.10	.07	.14	-.08	-.02	-.14
13. Innovative Product/Service	.11	.31	-.04	.07	-.10	.19*	-.05	-.17*

* Correlation is significant at the .05 level (2-tailed)

Table 3.2: Means, Standard Deviations and Pearson's Correlations (Contd.)

N = 137	7	8	9	10	11	12	13
1. Founding Success							
2. Investments in Network Size							
3. Investments in Relationship Quality							
4. Gender							
5. Age							
6. Years of Education							
7. Migration Background	1						
8. Prior Founding Experience/Failure	.19*	1					
9. Prior Founding Experience/Success	.09	-.15	1				
10. Family Support	.11	-.12	.03	1			
11. Support Former Employer	.02	.00	.06	-19*	1		
12. Full-Time Ambition	.09	.05	.02	.-.02	.09	1	
13. Innovative Product/Service	.10	.03	-.03	-.11	.03	-.04	1

* Correlation is significant at the .05 level (2-tailed)

Table 3.3 displays the results of our probit regressions. As the *LR-Chi²* test reveals, only the model including our network investment variables is significant. With respect to the control variables, the results show that the ambition to become self-employed on a full-time basis significantly increases the probability that a new venture is created. Keeping in mind that this variable should at least to some extent indicate nascent entrepreneurs' desire to found a business, this result is highly plausible. Additionally, our results reveal that negative prior founding experiences are a valid predictor of failure in founding a new venture, when all other influences, including network investments, are kept constant.

Table 3.3: Probit Estimation Results

N = 137	Model 1	Model 2	Model 3
Constant	-0.336	-0.684	-0.751
	(2.329)	(-0.30)	(-0.30)
Gender: (1=Male)	-0.388	-0.313	-0.368
	(-1.53)	(-1.20)	(-1.35)
Age: (in years)	0.0723	0.0951	0.0900
	(0.78)	(0.91)	(0.79)
Age Squared	-0.000974	-0.00131	-0.00124
	(-0.88)	(-1.04)	(-0.89)
Years of Education	-0.0345	-0.0393	-0.0308
	(-0.68)	(-0.76)	(-0.56)
Migration Background	0.100	0.110	0.287
	(0.23)	(0.25)	(0.64)
Prior Founding Experience/Failure	-0.587	-0.720	-0.829^{+}
	(-1.32)	(-1.58)	(-1.66)
Prior Founding Experience/Success	0.0538	-0.138	-0.248
	(0.16)	(-0.40)	(-0.71)
Family Support	0.218	-0.152	-0.997
	(0.40)	(-0.25)	(-1.55)
Support by Former Employer	0.00775	-0.0656	-0.197
	(0.03)	(-0.25)	(-0.73)
Full-Time Ambition	0.574*	0.661*	0.746*
	(1.99)	(2.27)	(2.38)
Innovative Product/Service	0.372	0.346	0.351
	(0.92)	(0.86)	(0.87)
Investments in Network Size		0.0190**	0.0712**
		(2.71)	(3.00)
Investments in Network Size^2			-0.000490*
			(-2.16)
Investments in Relationship Quality		0.139	1.534**
		(0.65)	(2.80)
Investments in Relationship Quality^2			-0.426**
			(-2.59)
LR-Chi² Test	29.50	38.58*	49.22**
Pseudo R^2	0.156	0.188	0.243

Standard errors in parentheses; $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$; all regressions additionally include dummies indicating a) economic environment and b) the amount of dept capital needed

With respect to our hypotheses, a joint test of significance reveals that the non-linear specifications in the regression models are correct. The null hypothesis stating that the coefficients of the quadratic terms of our network investment variables are jointly equal to zero is rejected at conventional significance levels by a Wald X^2 test (X^2 (2) = 9.14). Moreover, the null hypothesis stating that coefficients of the squared values of investments in network size and investments in relationship quality are separately equal to zero is also rejected at a conventional level of significance (Wald X^2 test (X^2 (1) = 4.69 and 6.70 respectively)).

Additionally, and as proposed by hypothesis 1, the coefficient of network size is significant and positive (β = .0712; p < .01), whereas the coefficient of the squared term is negative (β = -.0005; p < .05) and significantly different from zero as well. This indicates an inverted U-shaped relationship between the size of a nascent entrepreneur's network and founding success. It supports our argument stating that the decreasing resource returns of extending investments in network size are, beyond some limit, more than offset by their negative impact.

The results of our analysis also confirm our second hypothesis. As expected, the coefficient of the time invested in relationship quality (β = 1.534; p < .01) is also significant and positive, whereas the squared term has a negative and significant coefficient (β = -.426; p < .05). Indicating an inverted U-shaped relationship, this result provides confirming evidence for our notion that the combined cost and benefit effects of increasing investments in relationship quality leads to an inverted U-shaped effect on founding success.

To give a better impression of how network investments impact founding success, we plotted the predicted probabilities separately for both variables. Noting that the estimated probabilities in a non-linear model strongly depend on the contribution of the other covariates (Long & Freese, 2005; Mitchell & Chen, 2005), we estimated three different sets of predicted probabilities to test the robustness of our results.

Specifically, we estimated the predicted probabilities for (1) an 'average' nascent entrepreneur by setting all control variables at their means (Type A), (2) a female nascent entrepreneur without prior founding experience who is planning a traditional start-up on a part-time basis (Type B) and (3) a male nascent entrepreneur with experience in successfully founding a new venture and who is planning an innovative start-up on a full-time basis (Type C).

Figures 3.1 and 3.2 show the results. As the figures reveal, the relationships between network investments and founding success is positive at first but turns negative after a certain threshold is met. However, as already indicated by our numerical results, the proposed inverted U-shaped relationship between network investments and founding success is, at least within the range of values provided by our data, much better visible for investments in relationship quality than for investments in network size.

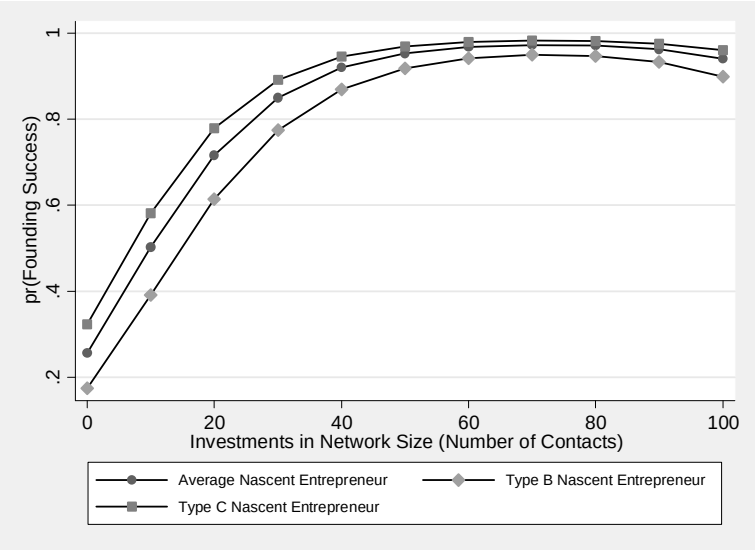

Figure 3.1: Investments in Network Size and Founding Success

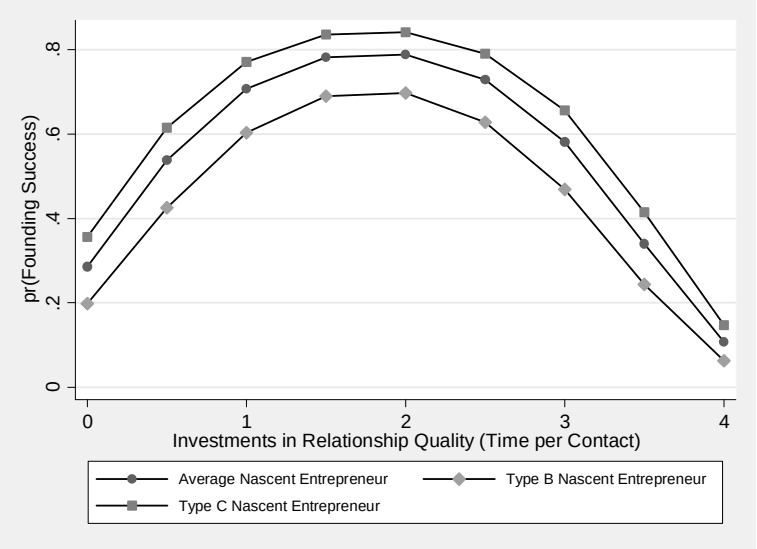

Figure 3.2: Investments in Relationship Quality and Founding Success

3.5 Discussion

We have argued that the relationship between nascent entrepreneurs' investments in either network size or relationship quality and their success in founding a new venture has an inverted U-shape. Based on social capital as well as network theory and research, we proposed that this relationship is grounded on two different effects—positive but diminishing resource returns and opportunity costs of time.

The results of the study largely support our hypotheses and provide confirming evidence for our reasoning. We show that both investments in network size as

well as investments in relationship quality may have positive effects for nascent entrepreneurs trying to found a new venture. However, our results also indicate that these positive effects are, beyond some limit, more than offset by a negative effect of further increasing network size and the average amount of time invested in every single relationship. As pointed out, this result may be partially explained by the diminishing marginal resource returns from increasing investments in network size and relationship intensity observed in a previous study (Semrau & Werner, 2009). However, the diminishing benefits of network investments cannot explain the downward turn of the slope. Therefore, another, negative effect of increasing investments in network size and relationship intensity has to be present as well. As we have outlined above, this might be explained by the opportunity costs of time and energy going hand in hand with maintaining more and increasingly intense network relationships.

However, we do not observe the inverted U-shaped relationship proposed equally clearly for both of the network investment variables addressed. While the downward turn of the slope is quite obvious for investments in relationship quality, the negative effect of further increasing investments in network size is much less pronounced. Although this difference may be based on the range of values for both explanatory variables in our sample, there might also be a theoretical explanation.

As outlined in the theory section, increasing the time spent on a single relationship leads to opportunity costs but also increases the respective network partner's motivation to grant access to his or her resources. When a network partner's motivation to grant access to his or her resources is already high enough to willingly share them with the nascent entrepreneur, any further time invested in intensifying the respective relationship only leads to additional costs without any additional benefits. Due to the heterogeneity of resources hold by different network partners, the cost-benefit ratio of further extending network size even when the network is already of considerable size might, however, lead to a different situation. Consider, for example, a nascent entrepreneur whose network already comprises several business consultants providing their help to write a proper business plan. When the relationship between the nascent entrepreneur and his or her consultants is very close, and the consultants provide all the support they can, any further increase in the relationship's intensity will not change the outcome. In contrast, extending the network even by adding one more business consultant, who will most probably have a slightly different and maybe even complementary perspectives on how a business plan ought to be structured, may still significantly increase output quality.

More generally, the fact that increasing network size will—even when it is not actively sought—most probably increase the heterogeneity of resources available through the network might explain why the downward turn of the slope describing the impact of further increasing investments in relationship quality is much steeper than the one describing the effects of further extending investments in network size. As we are not able to empirically address this proposition based on the data available, we would like to encourage further research to address the entanglement of network size and resource heterogeneity in detail.

3.6 Conclusion and Limitations

Considering our results, we see this study's contribution as follows: first, we contribute to network theory in the field of entrepreneurship by developing an explanation for an inverted U-shaped relationship between two types of network investments and founding success based on positive but diminishing resource returns and opportunity costs of time. In showing that our hypotheses hold empirically, we confirm previous research results showing diminishing marginal resource returns of nascent entrepreneurs' network investments and further complement these results by providing empirical evidence for opportunity costs of time that go along with these investments.

This practically implies that nascent entrepreneurs should on the one hand invest in their network to increase their chances of successfully founding a new venture by gaining access to additional resources needed. On the other hand, they should avoid exceeding the point where additional networking investments impede founding success because resource returns are more than offset by the costs of neglecting other tasks necessary for founding a new venture. In other words, nascent entrepreneurs should act strategically when developing and maintaining their networks to avoid resource deficits on the one hand, and neglecting other tasks important for successfully founding a new venture on the other.

We also have to note some limitations of our study. First, we gathered data only on the average amount of time spent by entrepreneurs on their network. Therefore, we were not able to identify how much time they actually dedicate to a specific network contact. Some of our respondents may have distributed their time equally among their network partners; others may have concentrated a great percentage of their time dedicated to their network on only a few relationships. Consequently, we cannot conclude that there is an inverted U-shaped relationship between investments in the intensity of a specific relationship and founding success. However, what we can infer from our data is that the relationship

between the additional time spent on a fixed number of contacts and founding success follows an inverted U-shape. We also note that our analysis is based on self-reported measures. As we have already described above, however, previous research supports the reliability and validity of self-reports (Brush & Vanderwerf, 1992; Lechner et al., 2006), and, as there are almost no objective data available on nascent entrepreneurs and their networks, this approach is the only one feasible.

Chapter 4

The Impact of Networking Ability on New Venture Performance: Mediating and Moderating Effects

4.1 Introduction

A large body of research indicates that social skills, defined as skills that are useful in interacting with others, play a major role in determining work outcomes in different settings (Witt & Ferris, 2003). In the job market, candidates with strong social skills tend to be more successful (Riggio & Throckmorton, 1988). Within organizations, people who are highly socially skilled receive better performance reviews from supervisors (Robbins & DeNisi, 1994), are promoted more often and get higher salaries (Belliveau, O'Reilly Iii & Wade, 1996). The performance implications of social skills have also been addressed more recently by entrepreneurship research. Baron and Markman (2003), for example, show that entrepreneurs' social skills strongly impact the financial success of new ventures, a result that is confirmed by Baron and Tang (2009).

However, even though the impacts of social skills on work outcomes in general and new venture performance have been widely recognized, little is known about how social skills exert their influence (Baum & Locke, 2004). With the notable exception of a study most recently conducted by Baron and Tang (2009), in which they show how entrepreneurs' social skills influence new venture performance by influencing entrepreneurs' effectiveness in acquiring information and other relevant resources, we lack empirical studies on the mechanisms explaining the impact of social skills on performance.

In the study at hand, we address this issue and analyze a) whether networking ability as a particular social skill affects new venture performance and b) whether the influence of networking ability may be explained by its impact on the size of the founders' support network. This approach seems to be fruitful for two reasons. First, networking ability, defined as the ability to develop friendships and build strong, beneficial alliances and coalitions (Ferris et al., 2005), is known to exert a strong influence on work outcomes such as employee income and career success (Ferris et al., 2008; Liu et al., 2007). Second, research has shown that the size of a support network has a significant impact on the success of new

ventures (Baum, Calabrese & Silverman, 2000; Lavie, 2007; Singh, 2000) because network relationships can help secure resources such as financial capital, or knowledge and information, which are essential for founding and developing a new venture (Ozgen & Baron, 2007).

Besides the impact of networking ability on new venture performance and its underlying mechanisms, we also test whether this relationship is moderated by a new venture's age. As we will explain in detail, such a moderating influence of venture age is highly plausible, because of two effects: first, and based on a lack of organizational legitimacy, we expect that younger ventures will have to rely more heavily on other characteristics—like entrepreneurs' social skills—to initiate and maintain network relationships. Second, and because of a greater dearth of resources, we expect more recently founded ventures to be more dependent on network relationships, which may more often provide resources that are necessary for successfully running a new venture than their older counterparts (Freeman, Carroll & Hannan, 1983).

Based on structural equation model analysis and a sample of 168 German entrepreneurs from various industries, our results show that networking ability may indeed exert a substantial impact on the performance of newly founded ventures. In line with our reasoning, this effect turns out to be partially mediated by the number of partners providing resources such as financial capital, other physical resources or knowledge and information. Additionally, and in line with our moderating hypothesis, this effect may only be observed in the subsample of younger ventures.

We thus see the contribution of our study as being threefold: by showing that networking ability may have a significant impact on new venture performance, we first confirm the results of previous studies regarding the influence of social skills. We also extend previous study results by providing insights into how the performance effects of individual social skills within an entrepreneurial context are mediated by the size of a new venture's support network. In providing confirming evidence for a moderating effect of venture age, we finally shed first light on how conditional factors may limit the impact of individual social skills on the performance of new ventures.

The chapter is organized as follows: in the next section, we develop our hypotheses. We then describe our research method before subsequently presenting and discussing our results. We conclude with some remarks on the limitations as well as the practical implications of our results.

4.2 Theory and Hypotheses

Several lines of evidence provide support for a link between new venture performance and entrepreneurs' social skills in general, and their networking ability in particular. First, recent research indicates that social skills may exert significant effects on outcomes in entrepreneurial settings. More specifically, Baron and Markman (2003) and Baron and Tang (2009) have shown in their respective studies that social skills such as social perception (the ability to perceive others accurately), expressiveness (the ability to express feelings and reactions clearly and openly) and social adaptability (proficiency in adapting one's actions to current social contexts) are significantly related to the income that entrepreneurs earn from their new ventures.

Second, studies within an organizational context have found that networking ability has a significant impact on employees' work outcomes. In particular, networking ability has been found to positively influence income (Ferris et al., 2008; Wolff & Moser, 2009) and managerial job performance (Semadar, Robins & Ferris, 2006). Additionally, it has been shown that networking ability—as a critical component of the concept of political skill—enhances employees' reputations and their job performance ratings (Liu et al., 2007). The reasoning is that individuals who are good at networking develop friendships and build strong alliances and coalitions, thanks to their typically subtle but engaging style, more easily than others do. They are "masters of the quid pro quo," (Ferris et al., 2005, p. 129) highly adept at negotiating, deal making and conflict management. They not only know who is worth incorporating into their network but also how to build their network in a "…contextually appropriate way" (Blass, Brouer, Perrewé & Ferris, 2007, p. 96). They are able to recruit contacts who hold resources that are valuable and necessary to foster their success (Ferris et al., 2005). Ferris et al. (2008) therefore argue that people with high networking ability are more successful in developing effective and advantageous partnerships, which can be utilized to achieve work-related objectives.

Based on this reasoning, we argue that not only employees' success within organizations but also founders' success in developing a new venture will be influenced by their networking abilities. It is widely recognized that entrepreneurs have to rely on external support to be successful in developing their new ventures (Jarillo, 1989; Stuart et al., 1999). For the development of a newly established business, entrepreneurs have to accomplish many different tasks and need diverse tangible and intangible assets such as financial capital, legal and market knowledge, legitimacy and many more, which they usually do

not possess in sufficient quantity or quality (Ensley et al. 2002; Singh et al. 1986). With networking ability being a key expertise in gaining access to resources (Ferris et al., 2008) we therefore propose that networking ability is directly relevant to the success of new ventures:

> ***H1:*** *Entrepreneurs' level of networking ability is positively related to the performance of their new ventures.*

4.2.1 New Venture's Network Size as a Mediator

While networking ability is an individual-level construct, which in the context of our study refers to the behavior of the one or more individuals who founded a new venture, the size of a network refers to a structural level of analysis and focuses on the extent of existing relationships (Adler & Kwon, 2002; Burt, 1992; Seibert, Kraimer & Liden, 2001). In the context of the study at hand, this concept refers to the number of network exchange relationships held by a new venture. Even though both elements reference different levels of analysis, we suppose that network size as a structural variable at least partially explains why networking ability impacts new venture success. Specifically, we propose that entrepreneur's networking ability, reflecting to what extent founders are able to proactively build and develop contacts, is a significant predictor of network size, which in turn influences new venture performance.

As a still-growing body of research in the field of entrepreneurship suggests, networks are important for founding and developing a new business (Elfring & Hulsink, 2007; Street & Cameron, 2007). More specifically, research indicates that network relationships are beneficial for entrepreneurs because they provide access to both tangible and intangible resources such as relevant information, expertise, complementary physical assets and even financial capital (Batjargal, 2003; Batjargal & Liu, 2004; Baum et al., 2000; Liao & Welsch, 2005). Compared to traditional market exchanges on the one hand and vertical integration on the other, network relationships are seen as providing new ventures with resources on much better exchange terms while avoiding capital investments and bureaucratic inefficiencies (Hite & Hesterly, 2001; Larson, 1992). Based on these insights, the impact of network size, expressed as the number of network-based exchange relationships held by a new venture, on new venture performance has been analyzed in a considerable number of studies (Street & Cameron, 2007). Among these, several studies conclude that the number of network relationships held by a new venture has a positive impact on its growth (Lee & Tsang, 2001; Raz & Gloor, 2007). The rationale is that larger

networks are made up of more people who have more resources, causing the quantity of resources available through the network to increase with its size (Lee & Tsang, 2001). A larger network also increases the variety of resources available, making it more likely that entrepreneurs will be able to satisfy different resource needs by approaching their network partners (Batjargal, 2003). In sum, we therefore expect network size to positively influence entrepreneurs' abilities to gather necessary resources (Hansen et al., 2001; Liao & Welsch, 2003).

Based on this reasoning, we argue that the impact of entrepreneurs' networking ability on the performance of new ventures is at least partially based on the fact that highly skilled entrepreneurs recruit more contacts that may be utilized for running a new venture than other entrepreneurs. The search for additional ties is often based on trial-and-error (Larson & Starr, 1993) and interactions with little-known individuals can seldom be pre-specified. As we have described above, individuals with strong networking ability are more extroverted by nature and they are highly skilled negotiators and deal makers (Ferris et al., 2008). As they are gifted with the power of their characteristically subtle style (Ferris et al., 2005), we expect entrepreneurs with high networking ability to have the intuition to convince potential partners of the value of a resource exchange. We thus propose that entrepreneurs with high networking ability are better able to establish more contacts with influential people who are helpful for developing and running a new venture than others. Consequently, they can easily develop relationships that widen the breadth of resources available through their network and as a result foster the growth of their new venture.

Consider for instance the prominent example of Dietrich Mateschitz, who founded the Austrian Energy Drink Company Red Bull. When he started his business, he did not have enough money to pay an advertising agency to develop and implement his premium marketing strategy. However, famous for his networking ability, he had a huge number of potential partners whom he could count on. Among these potential partners was the owner of an advertising agency, whom Mateschitz convinced to provide support in launching Red Bull. With this support, Mateschitz created an enormous marketing campaign that promoted the successful market entry of Red Bull and laid the ground for the brand's prosperity. In line with our theoretical reasoning, we thus propose:

> ***H2:*** *The effect of entrepreneurs' level of networking ability on new venture performance is mediated by the size of a new venture's network.*

4.2.2 Company Age as a Moderator

More recently founded enterprises are more likely to suffer from the liability of newness than older ones (Freeman et al., 1983; Singh, Tucker & House, 1986). As Stinchcombe (1965) argues, newly established firms have lower levels of legitimacy and depend more heavily on cooperation with strangers. Indeed, studies have found that mortality is age dependent for each kind of organization (Carroll & Delacroix, 1982; Freeman et al., 1983). Based on this insight, we expect company age to affect the impact of networking ability on new venture performance mediated by network size in two ways. First, we expect that the importance of individual networking ability for the size of a new venture's network decreases with a company's age. Second, we expect that the impact of the number of external network relationships on new venture performance diminishes with a company's age.

To establish cooperation, one has to verify his trustworthiness and cooperative behavior. The more one proves to be trustworthy, the more one is trusted by a partner, which leads to an improved willingness to cooperate (Fukuyama, 1995). However, due to the lack of a track record of prior co-operative experiences, newer firms are less likely to be seen as potentially attractive partners by other firms than they would be during later stages of the firm's life cycle. As more recently founded businesses cannot rely on any organizational reputation, they are perceived as having a highly uncertain future and a low likelihood of being able to meet expectations. Consequently, they will more often be distrusted by potential partners than companies that entered the market earlier and that have consequently built good reputations (Hite & Hesterly, 2001). To be successful in establishing relationships that go beyond simple market exchanges, younger enterprises will therefore have to compensate for their deficit in organizational legitimacy, and we argue that they may do so by relying on the networking abilities of their founders. To overcome a potential partner's reluctance to cooperate and extend his or her network, we expect younger venture founders to rely on their social skills to convince potential partners of their good intentions and competence. Accordingly, we expect that entrepreneurs from younger ventures in particular may benefit from distinct networking abilities, as they may use the power of their subtle style to compensate for their deficit in organizational legitimacy and to establish more network relationships than their less skilled counterparts.

As already mentioned, we additionally expect the impact of network size on new venture performance to be moderated by a company's age. As described in the previous paragraph, a new venture's network relationships are seen as critical

avenues for the acquisition of resources necessary for a firm's survival and growth (Gulati, 1998). For the development of a newly established business, entrepreneurs need diverse tangible and intangible assets such as financial capital, legal and market knowledge, which they usually do not possess in sufficient quantity or quality (Ensley, Pearson & Amason, 2002; Singh et al., 1986). However, as new ventures grow, they attain economic health, the first professional staff members come on board and basic financial, marketing and production systems are put in place (Churchill & Lewis, 1983). As a result, the venture becomes decreasingly reliant on cooperation with others. Traditional market exchange on the one hand and vertical integration on the other appear to be viable and, given that maintaining partner relationships takes time and energy (Watson, 2007; Witt, 2004), these may sometimes be more efficient alternatives. Based on this rationale, we expect that network ties in these cases will be less crucial than for older ventures. Combining these two lines of argument, we propose:

> ***H3:*** *The positive impact of networking ability on new venture performance mediated by network size is stronger for more recently founded ventures than for less recently founded ventures.*

4.3 Method

As noted by Markman et al. (2005), identifying a suitable sample is a methodological challenge in entrepreneurship research. We addressed this challenge as follows: in order to obtain a broad sample of newly founded ventures, we asked institutions organizing business plan competitions and coordinating startup funds to grant us access to their alumni. Due to anonymity issues, they refused to provide us with contact information but offered to invite their alumni to take part in our research. We therefore developed an online questionnaire that was accessible only with a user name and password that our partner institutions directly sent to the founder alumni. A total of 575 founders accessed and 221 finished our questionnaire, yielding a rate of completed responses of 38.4%.

We then followed VanderWerf and Brush (1989) in selecting our sample population according to some of the criteria commonly used in entrepreneurship research. We used two criteria to include businesses in this study. First, we only included companies that were independent, i.e., no subsidiaries of parent corporations. Second, we restricted our sample with respect to company age. Consistent with other studies in the field, we excluded all firms less than one year

old (Hansen, 1995; Sorenson et al., 2008) and any companies established more than ten years ago (Covin, Slevin & Covin, 1990; Lechner et al., 2006).

We then had to exclude another 13 data sets because of missing values, leaving 168 usable responses. This data collection approach certainly carries certain disadvantages. First, because we were not able to invite founders personally to participate in our survey, response bias may have been an issue. Consequently, we conducted two checks: we grouped respondents by arrival date and compared early to late respondents with respect to several of our independent and dependent variables using one-way analyses of variance. We additionally checked for nonresponse bias to the extent that anonymous respondents more closely resemble nonrespondents (BarNir & Smith, 2002). On the last page of our questionnaire, we asked our respondents to provide us with the name of their company and their e-mail address. As a result, we were able to compare the 64 anonymous respondents with 104 entrepreneurs who identified themselves. In both comparisons, no significant differences were found.

Second, our data collection approach definitely resulted in a convenience sample, which may raise representativeness issues. To deal with this, we compared our sample to data from the German Socio-Economic Panel Study (SOEP). The SOEP is a representative household panel survey conducted annually by the German Institute for Economic Research in Berlin and is often used for representative research on German entrepreneurs (Caliendo et al., 2009; Mueller, 2006; Schäfer & Talavera, 2009). We found a high degree of similarity between the entrepreneurs within our sample and the self-employed individuals within the SOEP. The small percentage of female founders (32%) within our sample, for example, matches well with the 31% self-employed females within the SOEP (Caliendo et al., 2009). Moreover, the observation that self-employed Germans are well educated, with 39% having finished secondary school, is also reflected by our data. As a result, we are confident that the results of our study are representative despite our use of a convenience sample.

However, our sample strategy also offers certain advantages. By not focusing on a single industry, which is the strategy adopted by many previous studies in the field (Baum et al., 2000; Maurer & Ebers, 2006; Stam & Elfring, 2008), the firms in our sample are diverse. More than 14 different industries, including life sciences, information technology, chemical products, construction, food, financial services, education, media and entertainment are included, which enhances the external validity of our results.

4.3.1 Measures

As there were no objective data available to represent the main exploratory and dependent variables in our study, we had to rely on self-reported measures. We are confident that this approach led to results with reasonable validity. First, most of our variables are concrete and will therefore be perceived and reported more accurately than psychometric properties (Fuchs & Diamantopoulus, 2009). Second, previous research in entrepreneurship gives broad support for the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006; Peng & Luo, 2000). Third, we took several additional steps to further ensure data quality. As described above, we asked our respondents to provide us with the name of their company and their e-mail address. A research assistant then searched the internet for information on those 104 companies that identified themselves and collected all the data of relevance to our study, such as firm age and the number of founding team members. The correlations between the self-reported measures and internet data were all highly significant and ranged from .97 ($p < .01$, $N = 41$) for company age to .98 ($p < .01$, $N = 49$) for the number of founding team members. Furthermore, we asked all those founders who contacted us after participating in our study to provide us with the contact details of a person outside their company who is acquainted with the founding team members and who we could interview to validate some of the answers given. We contacted the 18 people whose contact information we received and we asked them to rate the founding team member's networking ability. The correlations between founders' perceptions about founding team members' networking ability and how a founder's networking ability was perceived by others ranged from .84 ($p < .01$) to .94 ($p < .01$) for the items used. Finally, we conducted Harman's one-factor test to check for common-method bias. Five distinct factors were extracted, accounting for 74 percent of the total variance. While the first factor explained 20 percent of the variance, no one factor accounted for most of it.

4.3.1.1 New venture performance

Firm performance is a multidimensional construct, and measuring new venture performance in particular presents a significant challenge for scholars (Carton & Hofer, 2006; Chandler & Hanks, 1993). First, new ventures are usually privately held, with no obligation to divulge performance information. Traditional financial measures of performance are thus often unavailable. Second, evidence suggests that certain traditional measures may not be appropriate. Because of the

small starting base, growth rates are often enormous and erratic. In an attempt to move toward a solution for these challenges, Chandler and Hanks (1993) analyze the most common measurement approaches used in new venture performance research. Based on their empirical analysis, they conclude that new venture performance should be captured by two different variables—actual business volume and business volume growth. According to Chandler and Hanks (1993), using these two variables and operationalizing them in broad categories should help to overcome problems caused by unwillingness to disclose information. This may lead to measures with good internal consistency and external validity. Additionally, using both variables seems appropriate from a theoretical point of view with respect to the focus of our study because they capture different aspects of new venture performance. While business growth is included in both measures, the actual business volume additionally reflects the new venture's revenue in the first year of operation, which will likely vary with the number of pre-existing contacts that founders may utilize to kick start the business.

Based on this consideration, we constructed two items to gauge new venture performance. First, we asked our respondents to indicate their *business volume* in nine categories ranging from "1–up to 50 thousand Euro (T€)" to "9–more than 10 billion Euro (B€)". Second, we asked our respondents to indicate their cumulative *business volume growth* rate since 2005 or since the year in which the business was established (or since the year in which the business was established if the company was younger than three years). Growth rates were grouped in seven brackets ranging from "1–less than 5% up to 7–more than 200%". We then divided the cumulative business growth rates by three (or by company age respectively, if the company was younger than three years) to obtain a comparable average annual growth rate.

The responses for the business volume metric ranged from 25 T€ to 7 B€ with a median of 390 T€ and those for yearly growth from 1.3% to 300% with a median of 45%. To compensate for skewness, we used the natural log of the category means of both variables in our regression analysis.

4.3.1.2 Network Size

We followed the ego-centered approach to collect and analyze network data (Knoke & Yang, 2008; Wasserman & Faust, 1994). Ego-centered network analysis explores the relations around each sampled person and not the entire network of which individuals are members. In ego-centered network studies, focal respondents are asked to describe their relationships with other network

members (Burt & Minor, 1983; Knoke & Yang, 2008; Stam & Elfring, 2008). This form of analysis is especially appropriate for collecting data from a target population like entrepreneurs, who make up a small percentage of a population and whose relationships are not concentrated in a single social structure (Greve & Salaff, 2003).

The network variable in our study is the size of the exchange network. In line with Lechner, Dowling and Welpe (2006) we defined it as the number of exchange relationships that go beyond a simple market exchange with individuals (or organizations) outside the young enterprise. To further refine our measure and give our respondents additional information about the focus of our research, we established three different categories of relationships. Specifically, we distinguished partners who grant access to (1) financial capital, (2) physical resources, such as facilities, equipment or manpower and (3) knowledge and information. To capture *network size*, we asked our respondents to indicate the number of partners in each of the three categories. We then added the three item scores to obtain a single measure indicating the complete number of ties.

4.3.1.3 Networking Ability

To capture *networking ability*, we adapted three items from the networking ability scale of the Political Skill Inventory (Ferris et al., 2005; Ferris et al., 2007). Specifically, we asked our respondents to indicate on a seven-point scale to what extent the people in their founding team who liaise with external partners a) spent substantial time and effort networking with others, b) had been good at building relationships with influential people and c) were good at using their connections and network to make things happen even before the new venture was founded. We chose to use these three items because they cover all three different facets of networking ability—spending time on networking, building useful relationships and using connections to make things happen— which are usually captured with two items each by the networking ability scale. With a Cronbach's alpha of .86, the internal consistency of our three items is close to the value of .87 which is reported for the six items of the complete networking ability scale (Blass et al., 2007; Ferris et al., 2005).

4.3.1.4 Controls

As business volume and its growth are probably influenced by the number of people founding the new venture (Batjargal, 2006), we included the *number of founding team members* as a control variable. Since *company age* typically

corresponds with a firm's resource base and influences its revenue potential (Stam & Elfring, 2008) we included it not only to build subgroups and test our moderating hypothesis but also to control for effects within the age subgroups. As Rosenkopf and Schilling (2007) demonstrate, network structures may vary substantially across industries that differ in terms of technological dynamism and uncertainty. Accordingly, we included a dummy variable to indicate whether a firm belongs to a *high-tech industry* or not.

4.3.2 Analytical Approach

We tested our hypotheses using structural equation modeling (SEM). We chose SEM because it allows for simultaneously testing a system of relationships including mediating effects and for including networking ability as a latent variable. To investigate the moderating effect of venture age, we followed the approach described by Simonin (1999) and advocated a multiple-group model. To do this, we first computed the median company age (which equaled three years) and split the sample into two data sets. Then, in order to derive a first impression of whether the two groups differed and to decide whether we could apply the same measurement model for our latent variable, we tested our measurement model and our structural model for group invariance. To do this, we compared the comparative fit indices (CFI) of a) a configural model, for which all parameters are estimated freely, b) a model in which only the factor loadings for our networking ability items were constrained equally across groups and c) a model in which the paths between our theoretically considered variables were also constrained equally (Byrne, 2009; Meade, Johnson & Braddy, 2008). As the *CFI* comparison between models a) and b) exhibited no significant negative impact, we equally constrained the factor loadings of our indicator variables in all our subsequent analyses. In contrast to the aforementioned comparison, comparing model b) to model c) revealed that additionally constraining all paths between our theoretically considered variables across subgroups reduced the *CFI* from .96 to .94. As this is an indication of the different effects of our theoretically considered variables among more and less recently founded ventures, we subsequently tested our hypotheses by analyzing models in which only the measurement models were constrained across the two subgroups.

4.4 Results

Means, standard deviations and correlations for all variables are shown in Table 4.1.

Table 4.1: Means, Standard Deviations and Correlations

	***N* = 163**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	Networking Ability (factor score)	1						
2	Network Size	.20*	1					
3	Business Volume (in T€)	.07	.12	1				
4	Business Volume Growth (% per Year)	.04	.11	.03	1			
5	Firm Age	-.15	.02	.25*	-.23*	1		
6	Number of Founders	.27*	.08	.29*	.19*	-.08	1	
7	High-Tech Industry (Dummy)	.05	-.12	.05	.01	.13	.09	1
	Means	-.03	4.31	390.45	45.13	3.96	1.79	.57
	Standard Deviations	.97	5.56	8.09	65.97	2.62	1.07	.50

* Correlation is significant at the 0.05 level (2-tailed)

To test our hypothesis of a (partially) mediated effect of networking ability on new venture performance, we developed four different models: (1) a direct model, which includes the direct effects of networking ability on the number of preexisting ties, new ties and new venture performance; (2) a full model, in which the direct effect of networking ability on new venture performance as well as the proposed indirect effect of networking ability on new venture performance mediated by network size is included; (3) a mediation model, which includes only the effect of networking ability on new venture performance mediated by network size; and (4) a null model, in which no relationships other than the ones within the measurement model are posited and tested. To assess the fit of our models, we followed Schumacker and Lomax (2004), and considered various model fit criteria in combination, as listed in Table 4.2

Table 4.2: Model Statistics

Model	***Chi²***	***d.f.***	***p***	***Normed Chi²***	***RMSEA***	***CFI***
1. Direct Model (1)	56.22	42	.07	1.34	.05	.94
2. Full Model (2)	47.93	38	.13	1.26	.04	.96
3. Mediation Model (3)	54.48	42	.09	1.30	.04	.95
4. Null Model (4)	134.86	64	.00	2.11	.08	.73

To assess the global fit of our models, we chose to rely on two different criteria: the *Chi²* test, which is the only real statistical test of significance for structural

equation models (Schumacker & Lomax, 2004) and the root mean square error of approximation (*RMSEA*), which has recently been recognized as one of the most informative standards in covariance structure modeling (Byrne, 2009).

According to these two global fit measures—for which estimates are presented in Table 4.2—the direct as well as the full and the mediation models fit the empirical data quite well. The normed *Chi²* values (which are adjusted by degrees of freedom (*d.f.*)) of all three models lie within the recommended range of 1.0 to 2.0 (Hair, Anderson, Tatham & Black, 1995). Additionally, the *Chi²* test statistics show that all three theoretical specified models fit the sample data well, even though only the full model reaches a high level of insignificance ($p > .10$), which indicates a very close fit between the sample covariance matrix and the reproduced model-implied covariance matrix.

An assessment of *RMSEA* estimates for all three models should indicate how closely the covariance matrix based on the specified theoretical model would fit the population covariance matrix if it were available (Byrne, 2009). With values equal to .05 (direct model) or even less than .05 (full and mediation models) the *RMSEA* estimates suggest that the fit of all three models is very good.

To further compare the fit of the direct, mediation and full models with the independent model, we followed Bentler (1990) and relied on a comparison of the respective *CFI* values. This approach is considered superior to comparing their normed fit index (*NFI*) values because the latter method exhibits a tendency to underestimate fit in small samples. All the *CFI* values estimated for our models are well above the originally recommended and often cited cut-off point of .90 (Bentler, 1992; Hair, Black, Babin, Anderson & Tatham, 2006; Marsh, Balla & Hau, 1996), and close to or even above the more recently suggested value of .95. Accordingly, we conclude that the fit of all the models is very good.

4.4.1 Nested Model Test

In order to test the differences in statistical significance between the direct, mediation and full models we followed the approach described by Yli-Renko, Autio and Sapienza (2001). Specifically, we analyzed whether the *Chi²* values of the three models that differ in terms of the number of paths vary significantly (Steiger, Shapiro & Brown, 1985). The results of the sequential *Chi²* difference tests are shown in Table 4.3. With only a significant difference in the *Chi²* values indicating that a more complex model yields a better fit with the data, the results of our sequential tests support the hypothesis that there is an effect of networking ability on new venture performance, which is mediated by network size.

Table 4.3: Nested Model Testing Sequence and Difference Tests

Comparison		*Chi²* diff.	*d.f.* diff.	*p*	Model Preference
Model 2 vs. 4	Full vs. Null	86.94	26	.00	Full
Model 2 vs. 1	Full vs. Direct	8.29	4	.08	Full
Model 2 vs. 3	Full vs. Mediation	6.56	4	.16	Mediation

First, the *Chi²* difference comparison between the full model and null model suggests that the first provides a far better fit ($p < .01$). Second, the comparison between the full model and the direct model suggests that the full model—which additionally includes the indirect effect of networking ability on new venture performance—has a marginally significantly better fit with our data ($p < .10$). When comparing the full model and the mediation model—which is superior in terms of parsimony—it becomes clear that the mediation model is not significantly inferior in terms of explaining our empirical data ($p = .16$). This provides support for the hypothesis that there is a mediated effect of networking ability on new venture performance. To further test our hypotheses, we assess the statistical significance of individual parameter estimates for the model paths in the following section.

4.4.2 Path Coefficient Analysis

Consistent with the results of our invariance test reported earlier, the analysis of path coefficients, presented in Table 4.4, first shows that the impacts of our explanatory as well as our control variables differ significantly across our subgroups.

With respect to our control variables, company age has a significant effect in both subsamples. For more recently founded ventures, company age impacts both business volume ($p < .01$) and network size ($p < .10$), while only the effect on network size is also apparent within the subsample of older ventures ($p < .05$). Additionally, business volume is positively affected by the number of founders in the subsample of younger ventures ($p < .001$).

With respect to our theoretically proposed relationships, Table 4.4 shows that none of the paths predicted is significant in the subsample of older companies but that several significant effects can be observed for more recently founded ventures. This result indicates that the impact of networking ability on new venture performance is influenced by company age and provides first support for hypothesis 3. To get a more detailed impression of whether hypothesis 3 is

supported, we first have to analyze whether hypotheses 1 and 2 hold for younger ventures.

For younger ventures, the path from networking ability to business volume is statistically significant in the direct model (β = .33; p < .01) as well as the full model (β = .23; p < .05). This indicates that networking ability indeed influences new venture performance and provides support for hypothesis 1, even though a similar effect cannot be observed in the case of business volume growth.

Table 4.4: Standardized Path Coefficients for Both Subgroups

Description of Path	Younger Companies			Older Companies		
	Direct Model	Full Model	Mediation Model	Direct Model	Full Model	Mediation Model
Networking Ability → Business Volume	.33**	.25*		*n.s.*	*n.s.*	
Networking Ability → Business Volume Growth	*n.s.*	*n.s.*		*n.s.*	*n.s.*	
Networking Ability → Network Size	.30**	.29**	.29**	*n.s.*	*n.s.*	*n.s.*
Network Size → Business Volume		.24*	.31***		*n.s.*	*n.s.*
Network Size → Business Volume Growth		.23^{+}	.22*		*n.s.*	*n.s.*
High-Tech Industry → Network Size	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
High-Tech Industry → Business Volume	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
High-Tech Industry → Business Volume Growth	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
Company Age → Network Size	.20^{+}	.20^{+}	.20^{+}	.23*	.23*	.24*
Company Age → Business Volume	.33***	.29**	.27**	n.s.	n.s.	n.s.
Company Age → Business Volume Growth	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
Number of Founders → Network Size	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*
Number of Founders → Business Volume	.31***	.30***	.35***	*n.s.*	*n.s.*	*n.s.*
Number of Founders → Business Volume Growth	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*	*n.s.*

$^{+}$ p < .10; * p<.05; ** p< .01¸*** p < .001; *n.s. not significant*

Hypothesis 2 stated that network size mediates the relationship between networking ability and new venture performance. As described above, the comparative model assessment provides initial support for this hypothesis. To analyze this effect in greater detail, we now look at the relevant path coefficient constellation across the direct, full and mediation models to examine whether the three conditions necessary for mediation described by Baron and Kenny (1986) are met. These three conditions are (1) the predictor must be related to the

mediator; (2) the mediator must be related to the dependent variables; (3) the previously significant relationship between the predictor and the dependent variables should be eliminated (full mediation) or substantially reduced (partial mediation) when the mediator is accounted for.

As Table 4.4 indicates, the conditions for a partially mediated effect are met for the effect of networking ability on business volume. First, networking ability is positively related to business volume in the direct model (β = .33; p < .01). Second, network size is positively related to business volume in both the mediation model and the full model (β = .31; p < .001 and β = .24; p < .05). Finally, the previous significant effect of networking ability on business volume is reduced significantly when network size is included (from β = .33; p < .01 to β = .25; p < .05). This result shows that hypothesis 2 holds for younger companies. Furthermore, our results show that network size exerts a positive effect on venture performance in terms of business volume growth in the full model as well as in the mediation model (β = .23; p < 10 and β = .22; p < .05 respectively).

To summarize, testing hypotheses 1 and 2 with the subsample of more recently founded ventures leads to the following results: (1) networking ability exerts a significant influence on new venture performance in terms of business volume; (2) this effect is partially mediated by a new venture's network size; (3) there is an additional positive effect of network size on business volume growth.

Based on these results for hypotheses 1 and 2, we can now turn back to hypothesis 3. Hypothesis 3 predicted that the positive impact of networking ability on new venture performance would be moderated by company age and should be stronger for younger ventures than for older ones. Our results show that hypotheses 1 and 2 hold in our subsample of more recently founded ventures. In contrast, there is no significant effect of networking ability or network size in the subsample of older ventures. Accordingly, hypothesis 3 is largely supported by our data.

4.5 Discussion

Our work confirms and complements previous findings in different fields of entrepreneurship research. First, our results provide supporting evidence for the proposition that networking skills have an impact on younger ventures' performance. Second, our comparative model analysis clearly demonstrates that the impact of networking ability on the performance of young ventures is partially mediated by that venture's network size. This indicates that there are two different effects of networking skills in the context of a new venture's

performance. First, the observed indirect effect confirms our idea that networking ability enables founders to establish more network relationships to secure resources necessary for success such as financial capital, other physical resources and knowledge. Second, there is a persisting direct effect of networking ability on new venture performance, which may be explained by taking into account that our measure of network size does not include customer relationships. The observed direct effect may thus suggest that newly founded ventures also profit from founders' networking ability by being better at establishing relationships with customers that go beyond simple market exchange.

However, we also have to acknowledge that, even in the subsample of more recently founded ventures, only one of our dependent variables—namely business volume—is significantly influenced by networking ability. Neither a direct nor an indirect effect of networking ability was observed for business volume growth, even though growth turned out to be influenced by network size.

This result might be explained by considering the differences between both measures of new venture performance used and insights from research on entrepreneurs' network dynamics. As already outlined within our methods section, actual business volume reflects two aspects of new venture performance—the new venture's business volume in the first year of operation and the accumulated subsequent growth—while business volume growth 'only' captures growth. According to the propositions developed in research on entrepreneurs' network dynamics, a new venture's performance in the initial years after founding should be largely influenced by the personal social contacts that founding team members bring into the business. Developing new and calculative network relationships in contrast is assumed to be necessary to foster subsequent growth (Hite & Hesterly, 2001; Larson & Starr, 1993). With this argument in mind, our results might imply that networking abilities primarily impact new venture performance because founders with superior networking ability are better able to use pre-existing working relationships, voluntary connections and kinship and community ties to quickly establish network relationships for their new venture, which are primarily useful to rapidly establish a considerable business volume. Even though this interpretation is in line with the propositions derived by researchers dealing with ventures' network dynamics and evolution (Hite & Hesterly, 2001; Larson & Starr, 1993), we are of course lacking clear empirical evidence to support this notion and would therefore like to encourage other researchers to further address this issue in the future.

Finally, our analysis across subgroups provides large support for the hypothesized moderating effect of venture age. Whereas our results clearly show that networking skills have an impact on performance which is partially mediated by network size for younger ventures, no such effect is observed for older ventures. This supports the argument that we put forward when developing hypothesis 3. It confirms that more recently founded ventures will have to rely on the personal networking ability of their founders to a much greater extent than their older counterparts to compensate for a deficit in organizational legitimacy due to the liability of newness (Freeman et al., 1983; Singh et al., 1986). Additionally, this result indicates that the performance of younger enterprises is much more strongly dependent on the size of their networks that provides resources such as financial capital, knowledge and information than the performance of more established ventures.

4.6 Limitations, Contributions and Implications

We note several limitations of our study. The limitations that are associated with the use of self-reported data, as well as the steps we have taken to deal with this potential issue, have already been discussed in detail in the method section. We further acknowledge the usual limitations of cross-sectional studies. Even though the networking ability items we used have a timeline that supports the direction of influence proposed in our hypotheses, a clear causal interpretation of our results may remain problematic. One could reverse the interpretation of the pertinent results to some extent and say that the existence of more network relationships could lead to a self-perception of strong networking ability. However, there are several arguments against this interpretation. First, recent studies on the effects of political skills—which include networking ability—have employed longitudinal designs, meaning that skill-related data were collected at one point in time and data on various dependent measures were collected afterwards. In these studies, networking ability has been found to clearly predict positive work outcomes (Ferris et al., 2005; Hochwarter et al., 2007). Closely related to the preceding point, recent research also indicates that even though political skills can be improved through training and other interventions, they are quite stable over time (Treadway, Ferris, Duke, Adams & Thatcher, 2007). Together, these arguments offer significant support for our causal interpretation, which suggests that entrepreneurs' networking ability contributes to the success of their new ventures. We would, however, encourage further research to also

employ such longitudinal research designs in the entrepreneurship context to shed further light on this issue.

Notwithstanding these limitations, we are confident that our study offers several contributions. First, our results confirm and extend previous findings regarding social skills and performance in entrepreneurship. By applying the concept of networking ability to the field of entrepreneurship research, we shed further light on the relevance of social skills for new venture performance. We additionally contribute to an understanding of how social skills in general and networking ability in particular influence new venture performance by demonstrating a mediating effect of network size. With the notable exception of the study conducted by Baron and Tang (2009), such causal explanations for how social skills lead to subsequent performance benefits have not been adequately addressed to date. Finally, we provide clear evidence for a moderating effect of venture age on the relevance of networking ability on new venture performance. In so doing, we shed light on how conditional factors may limit the impact of individual social skills on the performance of new ventures.

The present findings also offer practical implications for entrepreneurs. Based on the result that networking ability and network size have a significant impact on the performance of new ventures in their first years of development and the notion that networking ability is a trainable skill, which is nonetheless quite stable over time (Treadway et al., 2007), we conclude that especially entrepreneurs in the earlier stages of the founding process should consider including people with significant networking abilities into their founding team. Furthermore, they should seek assistance and training opportunities to enhance their networking abilities so that they can be more successful when launching and operating their new ventures.

Chapter 5

Designing Relationship Management–How Specialization and Integration Fosters New Ventures' Network Change and Network Management Capacity

5.1 Introduction

Entrepreneurs need a wide variety of tangible and intangible assets, such as financial capital, legal and market knowledge, to found and further develop their new ventures (Ensley et al., 2002; Singh et al., 1986). Because entrepreneurs' and even founding teams' resource endowments are usually constrained in terms of quantity and quality, they usually rely on their network to get additional support (Davidsson & Honig, 2003; Jarillo, 1989; Stuart et al., 1999). The network relationships entrepreneurs possess when founding their venture are, however, usually not able to provide all the resources necessary for successfully developing a new venture (Hite & Hesterly, 2001). During early start-up development, entrepreneurs' social networks are typically made up of relatives, friends and acquaintances (Hite & Hesterly, 2001). Even though these relationships are valuable, laying the groundwork for new venture emergence, evolving resource needs usually necessitate a shift in networks to sustain growth in later stages of corporate development (Hite & Hesterly, 2001; Lechner et al., 2006). To satisfy these more diverse, dispersed resource needs, young firms therefore have to form new network relationships and align their mix of ties (Elfring & Hulsink, 2007; Hite & Hesterly, 2001).

For various reasons, adapting their network to changing resource needs is not easy for new ventures. First of all, new ventures suffer from the liability of newness, resource constraints and a lack of history of partnerships, which limit their initial pool of potential partners (Delmar & Shane, 2004; Milanov & Fernhaber, 2009). Moreover, research in the fields suggests that even young ventures suffer from inertial tendencies that hinder network change (Batjargal, 2006; Elfring & Hulsink, 2007; Maurer & Ebers, 2006).

Based on these insights and the fact that network change is widely recognized as an important task for entrepreneurs trying to successfully develop their new venture, the dearth of quantitative research addressing network change is

surprising (Schutjens & Stam, 2003; Stuart & Sorenson, 2007). To the best of our knowledge, there are very few quantitative studies explicitly addressing new ventures' network change in terms of its fundamental primitives—establishing new ties and dissolving existing relationships (Koka et al., 2006)—as a dependent variable (for notable exceptions, see Batjargal, 2006; Milanov & Fernhaber, 2009). Moreover, still less is known about what founders may actively do to enhance the development of their network (Hite, 2005; Stuart & Sorenson, 2007).

In the present study, we address this gap in research. We develop and test hypotheses on how entrepreneurs may foster network change and enhance their network management capacity by applying the fundamental principles of organizational design to their network relationship management. Specifically, we build on prior qualitative research to develop three hypotheses on how a specialized and integrated network relationship management helps to increase (1) the number of new network relationships created, (2) the number of relationships dissolved and (3) the total number of network relationships that may be held by new venture members at a given time. We then test these hypotheses using a large-scale sample of new ventures from different industries in Germany.

When developing and testing our hypotheses, we refer to a network relationship or tie, when an exchange relationship between a new venture and its network partner goes beyond simple market exchange. Additionally, we define a specialized and integrated relationship management as given, when a) different members of the new venture are explicitly assigned responsible for managing the network relationships with different types of network partners; and when b) information on network relationships is communicated and discussed among new venture members on a regular basis.

The results of our empirical analysis provide broad support for our hypotheses. They show that new ventures with specialized and integrated network relationship management develop more new network relationships, dissolve more pre-existing ones and hold more network relationships in total.

Considering these results, we see the contributions of our study as follows: in showing that applying the principles of organization design to the network relationship management fosters network change and network management capacity, we contribute to the theory of network change. Furthermore, our results provide indirect evidence for the notion that new ventures in different industries are affected by network inertia. Finally, our results have clear implications for the practice of new venture management. According to the insights provided,

new ventures facing a distinct need for network change and managing a large number of network relationships at once should implement a specialized and integrated relationship management to be better able to reach their objectives.

The rest of the chapter is organized as follows. In section 2, we present our theory and develop our hypotheses. In section 3, we describe our research method and we present the results of our study in section 4. We then discuss our results in section 5 and finally present our conclusions, as well as the limitations of our study, in section 6.

5.2 Theory and Hypotheses

As a growing body of research in the field of entrepreneurship suggests, networks are important for founding and developing a new venture (Davidsson & Honig, 2003; Jarillo, 1989; Street & Cameron, 2007; Stuart et al., 1999). More specifically, research indicates that network relationships are beneficial for entrepreneurs because they provide opportunities to access tangible and intangible resources such as relevant information, expertise, complementary physical assets and even financial capital to much better conditions than traditional market exchange on the one hand and vertical integration on the other (Hite & Hesterly, 2001; Larson, 1992). Therefore, the social networks of entrepreneurs—comprising family members, friends and existing business contacts—are often a most valuable asset to overcome the liability of newness (Larson & Starr, 1993; Lechner et al., 2006; Starr & Macmillan, 1990).

Even though the pre-existing social relationships of entrepreneurs often lay the groundwork for successful new venture creation, recent research indicates that the relative importance of these network ties decreases over time (Hite & Hesterly, 2001; Lechner et al., 2006). As new ventures evolve, their resource needs change and make shifts in networks inevitable for successful future growth (Elfring & Hulsink, 2007; Hite & Hesterly, 2001). To align their network to these changing resource needs, entrepreneurs have to develop new relationships that are more business focused than those close, relationally embedded ties that had been helpful for new venture emergence (Hite, 2005; Hite & Hesterly, 2001; Schutjens & Stam, 2003). Based on this reasoning, adjusting their network of relationships is a major task for entrepreneurs, trying to successfully develop their new ventures. As we will discuss below, however, fulfilling this task is not easy.

5.2.1 Barriers to new venture's network change

As several researchers in the field point out, entrepreneurs face severe constraints when trying to change their network by creating new relationships and dissolving existing ones. The reasons for these constraints are manifold. First of all, new ventures suffer from the liability of newness, resource constraints and a lack of history of partnerships; these problems limit their ability to attract potential partners (Delmar & Shane, 2004; Milanov & Fernhaber, 2009). Moreover, insights from qualitative studies in the field suggest that young ventures' network change is hindered by several inertial tendencies. Based on comparative case study analysis, Maurer and Ebers (2006) point to the fact that scientists founding biotechnology spin-offs often have difficulties when trying to adapt their networks to the new challenges they face because they are locked in their prior relationships. According to Maurer and Ebers (2006), the reasons for this problem are twofold: first, scientists tend to stick to the cognitive schemes and frames of reference valid in their former professional life, even when confronted with the challenges of their new career. As a result, they do not have the motivation and the ability necessary to effectively interact with potential new network partners. Furthermore, the scientists observed by Maurer and Ebers (2006) were also relationally constrained in developing their network, as obligations and commitments to pre-existing relationships combined with limited relationship management capacity deterred them from developing new ties.

Although these detailed results have been generated in the specific field of biotechnology startups founded by former scientists, evidence indicates that the same barriers may also hinder network change for young ventures when setting up new ventures in other industries. Based on an analysis of 32 IT start-ups in the Netherlands, Elfring and Hulsink (2007) also provide empirical evidence for the proposition that entrepreneurs might be locked in prior relationships. Additionally, two quantitative studies in the field provide support for the notion that founders in general may be constrained by inertial tendencies that impede network change. First, a panel study of 154 young firms in manufacturing and business services in the Netherlands reveals that even though young firm networks tend to expand in the course of corporate development, socially based relationships still play a major role three years after founding a new venture (Schutjens & Stam, 2003). Second, Batjargal's (2006) longitudinal study of Russian entrepreneurs in a broad range of industries shows that changes of entrepreneurs' networks in the number of new network relationships established is constrained by the number of pre-existing ties. He explains this effect in terms

of “relational inertia” (p. 306), based on the tendency of social actors to prefer partners with whom they already have transacted in the past.

We consider these empirical results as indicators for the proposition that entrepreneurs setting up in a broad range of industries may face serious constrains when trying to develop their networks. In the following, we describe in detail what a specialized and integrated relationship management means and deduce hypotheses on why it may help new ventures to develop new network relationships, dissolve pre-existing ones and increase the size of the network they are able to manage.

5.2.2 Specializing and Integrating Relationship Management

Specialization and integration are the two basic means of organization design. Specialization indicates that an organization is differentiated into subsystems that are assigned to deal with specific tasks or with a specific part of an organization’s environment, such as clients or suppliers (Jones, 2001). As organizational theory proposes, specializing organizational subsystems such as units or people is beneficial because it enhances the subsystems’ ability to efficiently interact with their respective environments (Burns & Stalker, 1961; Lawrence & Lorsch, 1967). This proposition is grounded on the fact that people assigned to interact solely with a specific part of an organization’s environment do so more often than their non-specialized counterparts. They thus accumulate greater expertise in dealing with that specific part or an organizations’ environment and become more effective and efficient in doing so (Weiss, 1971; Yelle, 1979).

Organization theory, however, also recognizes that specialization may lead to certain problems when there is no additional integration in terms of communication between specialized subunits (Galbraith, 1973). As organizational theorists argue, specialization fosters the development of different goals, norms and perspectives among specialized actors and therefore reduces the probability that one specialized actor adequately considers the goals and perspectives of other actors when making decisions (Lawrence & Lorsch, 1967).

We now apply the two basic means of organization design to the relationship management of entrepreneurs and will show how a specialized and integrated relationship management may foster new ventures’ network change and network management capacity. Even when doing so, we fully acknowledge that young ventures are usually not divided into specialized organizational subunits in the early stages of their development (Churchill & Lewis, 1983; Greiner, 1972).

Moreover, we do not deny that it may even be efficient for new ventures not to differentiate their operational business into specialized subunits but to choose one general unit as an overall organizational structure (Hanks & Chandler, 1994; Meijaard et al., 2005). We will suggest, however, that new ventures may well profit from implementing a specialized and integrated form of relationship management.

In line with the general description of specialization given above, we define a specialized relationship management as taking place when different members of a young venture are involved in relationship management and each of them is assigned to manage the venture's network relationships with specific types of network partners such as partners providing financial capital and partners for project-based collaboration. In case of a new venture offering below the line advertising solutions like direct mail and e-mail promotion, specialized relationship management could mean that one member of the new venture is assigned to manage the relationships with venture capitalists and/or banks; another might be responsible for establishing and maintaining relationships with partners for cooperation, such as companies offering above the line marketing solutions.

In line with the general arguments given above, we expect a specialized relationship management to have two different effects. First of all, it will enable new venture members to more efficiently manage the external partners for whom they are responsible. As specialization increases, the rate of interaction between new venture members and the types of network partners they are assigned to manage increases as well. New venture members specializing in managing specific kinds of network relationships will thus accumulate greater expertise about their partners' goals and mind-sets (Hammer & Champy, 1993; Westerlund, Rajala & Leminen, 2008).

On the other hand, we also expect a specialized relationship management to have the aforementioned negative effect and lead to increasingly different mind-sets and perspectives between those members of a new venture who are involved in managing network relationships. We thus expect a specialized relationship management to increase the need for integration and refer to integration with respect to network relationship management when important relationship management issues are communicated and discussed internally on a regular basis.

Based on this overview of how specialization and integration should affect network relationship management among new ventures, we will below develop

detailed hypotheses on how a specialized and integrated relationship management may foster change of a new venture's network in terms of three processes: (1) facilitating the development of new relationships; (2) making the dissolution of (pre-)existing relationships easier; and (3) enabling new ventures to hold more network relationships at once.

5.2.2.1 A Specialized and Integrated Relationship Management and New Tie Development

As described above, new ventures have to establish new network relationships to further develop their new ventures but it is not easy for them to do so. Not only do they face severe problems in attracting potential partners due to a lack of organizational legitimacy but also their motivation and ability to identify and attract new potential partners is constrained by not being able to easily adjust their cognitive schemes and frames of reference to the new challenges.

Based on this, we propose that a specialized and integrated relationship management may help to foster new relationship development. As outlined by Ibarra, Kilduff and Tsai (2005), transitions in work roles are facilitated by a process of shifting network connections and such a transition is exactly what happens when a specialized network relationship management is introduced. When members of a young venture are assigned to concentrate on managing a specific type of network relationship, this increases the frequency of interaction between them and the network partners they are assigned to deal with. At the same time, the frequency of interaction between new venture members and their initial contacts is largely decreased. This alteration in interaction patterns will enhance change in the new venture members' work identities, however (Ibarra et al., 2005). With a focus on interacting with a specific type of external partners, new venture members will develop a deeper understanding for their partners' goals and mind-sets, which will increase mutual understanding (Aldrich & Reese, 1993; Chunyan, 2005) and help to adapt those frames of reference that were functional for efficient interaction in their former professional careers, but which impede their motivation and ability to connect with potential partners relevant for developing the new venture. Therefore, we expect a specialized relationship management to foster the development of new network relationships by helping to overcome the cognitive barriers responsible for being locked in prior relationships.

However, we also expect that a specialized relationship management alone will not be sufficient for developing new relationships. While a specialization of the

relationship management function will help members of a newly founded venture to develop expertise in interacting with specific kinds of external partners, we expect that the different perspectives of other new venture members have to be integrated to establish new, sustainable exchange relationship.

Consider a situation in which a newly founded advertising agency tries to initiate a partnership with another company that develops creative design solutions to jointly offer a combination of their products. If the working practices of the focal venture and potential partner are significantly different, conflicts will almost inevitably arise. In such a situation, specializing the relationship management function may help to initially understand the partner's needs, e.g., a partner's preference for more flexible deadlines so that he can come up with tailor-made solutions. To establish a working routine that fits the new partner's needs as well as those of the new venture, which is prerequisite for a functioning exchange relationship (Ariño & de la Torre, 1998; Madhok & Tallman, 1998), it is inevitable that other new venture members' perspectives are integrated in the process. Consequently, we expect that young ventures not only have to specialize but also to integrate their relationship management to be able to establish new network exchange relationships. Accordingly, we propose:

> ***H1**: A specialized and integrated relationship management will enhance change in new ventures' networks by increasing the number of new network relationships established.*

5.2.2.2 A Specialized and Integrated Relationship Management and the Dissolution of Ties

As we have outlined above, adding new ties to an existing network is necessary for entrepreneurs trying to further develop their venture. Adding new partners, however, may risk overloading the network when existing relationships are not dissolved simultaneously (Elfring & Hulsink, 2007). As pointed out by several researchers in the field, considerable time and energy has to be invested to maintain active network partnerships (Ebers & Grandori, 1997; Witt, 2004), which limits the number of network relationships manageable by members of a new venture at a given time (Batjargal, 2006). This implies that adding new partners to a pre-existing network is, when the network has reached a considerable size, possible only when older relationships are dissolved. But doing so may be difficult for entrepreneurs.

In general, social relations are path dependent, with actors preferring to interact with others who are well known and with whom they have interacted in the past

(Gulati, 1995; Podolny, 1994; Tsai, 2000). As embedded relationships reduce the potential for opportunism, this behavior is at least partially rational in stable environments (Granovetter, 1985; Uzzi, 1996), but is a clear obstacle when new network relationships are needed to face changing resource demands, as entrepreneurs do when trying to develop a new venture. Nevertheless, the tendency to prefer well-known actors as network partners is also observable among entrepreneurs (Batjargal, 2006; Kim & Aldrich, 2005; Larson, 1992).

However, there is another factor that impedes network change in terms of switching from an existing network relationship to a new one, even when the new one may be more valuable. Network exchange relationships are based on norms of reciprocity and mutual obligation, which means that the one who receives resources from another has some duty to repay the favor, even if there is no binding contract (Blau, 1964; Coleman, 1990). This fact may further constrain actors' ability and motivation to dissolve existing relationships. Because of these prevailing norms, dissolving an existing relationship may be considered illegitimate and thus sanctioned by former partners. Furthermore, dissolving an existing network relationship may also be sanctioned by other partners of the focal actor. This is especially probable when the network partners of a focal actor are highly interconnected and perceive the relationship dissolution decision as illegitimate and running counter to existing norms of reciprocity (Brass, Butterfield & Skaggs, 1998; Gargiulo & Benassi, 2000; Sullivan, Haunschild & Page, 2007).

Given that young ventures' networks—especially in the earlier stages of their corporate development—mainly consist of relationally embedded ties characterized by a high degree of personal and social identification (Hite, 2005; Hite & Hesterly, 2001), it is highly plausible that these potential consequences hinder change in new venture's networks and help explain relational lock-in (Batjargal, 2006; Gargiulo & Benassi, 2000; Ibarra et al., 2005; Maurer & Ebers, 2006).

Based on this reasoning, we now argue that a specialized and integrated relationship management may help young ventures to overcome relational lock-in and make dissolving existing relationships easier. When a specialized relationship management function is first introduced within a new venture, there will be changes in relationship management responsibilities. Several network relationships will no longer be managed by their original social contact within the new venture but instead by someone else who is officially assigned to manage the specific type of network relationships they have cultivated. We therefore expect a specialized relationship manager to feel less relationally

obliged towards the pre-existing network members than the original contact holders who are more socially involved in these relationships.

There are also other reasons for expecting an assigned relationship manager to be more willing and better able to overcome relational obligations and dissolve pre-existing relationships. Due to the expertise a specialized relationships manager accumulates in repeated interactions with a specific type of partner, he or she should be better able to objectively assess the business value of pre-existing socially embedded relationships. This value now typically decreases in the course of corporate development because socially based relationships are in many cases not adequate for securing the more diverse, dispersed resources needed to sustain new venture growth in the course of their corporate development (Hite & Hesterly, 2001; Lechner et al., 2006). As this decline in partner value should be more easily recognized by a specialized relationship manager, we expect him or her to be more highly motivated to dissolve pre-existing relationships.

Moreover, and based on insights from role theory, we also expect that other network partners will less likely sanction relationship dissolution decisions made by a new young venture, if the decision is made by a specifically assigned relationship manager. According to Ring and Van de Ven (1994) and Guiot (1977), individuals' reactions to the behavior of others vary significantly when the other is either seen as acting within a business role or qua persona. Based on this observation and the expectation that a relationship dissolution decision will more likely be attributed to a role-based rationale when made by a specialized network relationship manager, we propose that decisions to dissolve pre-existing relationships will less likely lead to sanctions by other network members when made by someone specifically assigned to manage a certain kind of network relationship.

Summing up these arguments, we expect that new ventures with a specialized network relationship management will be able to more accurately assess the value of pre-existing relationships, and face fewer constrains when attempting to dissolve relationships.

Analogous to what we have described before, however, we propose that an integrated relationship management is also necessary to significantly increase the number of partnerships dissolved by the new venture. Even when a specialized relationship management is established, the decision to dissolve an existing exchange relationship is not an easy one to make, especially when at least one member of the new venture is still socially involved in the network relationship in question. Consequently, and in line with empirical evidence from group

decision-research (Moscovici & Zavalloni, 1969), we expect that even specialized relationship managers will hesitate to decide upon dissolving such a relationship on their own authority. Conversely, we expect a specialized network relationships manager to seek approval and support by discussing the decision with other new venture members. Consequently, we propose that a specialized and integrated relationship management will significantly increase the number of relationships dissolved by the new venture:

> ***H2:*** *A specialized and integrated relationship management will enhance new ventures' network change by increasing the number of relationships dissolved by the new venture.*

5.2.2.3 A Specialized and Integrated Relationship Management and Network Size

As we have outlined above, we expect a specialized and integrated relationship management to increase the number of new relationships established and the number of relationships that will be dissolved by the new venture. Depending on the distinctiveness of these two effects, the overall effect on network size could be positive in terms of increasing the number of network relationships, but may even be negative and lead to a decrease of the total size of a new venture's network.

Acknowledging that both of these options are possible in general, we propose that the overall impact of a specialized and integrated relationship management on the size of a new venture's network will be positive. In doing so, we take two different effects into account. First, and in line with other theorists in the field, we expect new ventures to be willing to establish larger networks with an increasing number of partners in order to enlarge the resource base they may access (Elfring & Hulsink, 2007; Maurer & Ebers, 2006; Schutjens & Stam, 2003). Second, we take into account that the size of new ventures' networks is also influenced by the ability of the new venture to satisfy its partners' needs, and we propose that a specialized and integrated relationship management will help them to successfully manage more network relationships at once.

Prior research on alliances has found that partner satisfaction is crucial for the survival of cooperative relationships (Ellram, 1991; Morgan & Hunt, 1994). Exchange partners will remain in a relationship only as long as they perceive it as being efficient for their own purposes, and expect it to remain so (Ariño & de la Torre, 1998; Madhok & Tallman, 1998). According to Das and Teng (2002, 2003), a main factor that affects the perception of cooperation efficiency is

conflict, which arises when the preferences, interests and practices of alliance partners diverge significantly. Based on this insight, we propose that a specialized relationship management helps to avoid conflicts and thus enables new ventures to manage more network relationships at once.

As explained above, a specialized relationship management enables young venture members to accumulate greater expertise about partner-specific goals and mind-sets. With this accumulation of knowledge, a greater degree of understanding develops between new venture members and their designated counterparts. This higher degree of mutual understanding, however, should enhance new venture members' ability to anticipate and account for partners' needs, making it much easier to avoid controversies and conflicts within existing exchange relationships (Hammer & Champy, 1993; Westerlund et al., 2008). With controversies and conflicts in turn being a major factor impeding exchange partner's perception of efficiency and satisfaction, we expect a specialized relationship management to help young ventures to efficiently manage a larger number of network exchange relationships at once.

Again, however, we do not expect a specialized relationship management to be sufficient to increase the total number of network relationships young ventures may manage at a given time. As we have outlined when developing our first hypothesis, additional members of the young venture will inevitably be involved to make exchange relationships work on the long run. Consequently, we propose:

> ***H3:*** *A specialized and integrated relationship management function will have a positive overall effect on the size of a new venture's network.*

5.3 Data and Method

As noted by Markman, Baron and Balkin (2005), identifying a suitable sample is a methodological challenge in entrepreneurship research. To meet this challenge, we asked institutions organizing business plan competitions and coordinating start-up funds to grant us access to their alumni. Due to anonymity issues, they refused to provide us with contact information but offered to invite their alumni to take part in our research. We therefore developed an online questionnaire that was accessible only with a user name and password that our partner institutions directly sent to the founder alumni. A total of 575 founders accessed and 221 finished our questionnaire, yielding a completion rate of 38.4%. We then followed VanderWerf and Brush (1989) in selecting our sample population according to some of the criteria commonly used in entrepreneurship research. We used two criteria in selecting businesses for our study. First, we only

included companies that were independent, i.e., no subsidiaries of parent corporations. Second, we restricted our sample with respect to company age. Consistent with other studies in the field, we excluded all firms less than one year of age (Hansen, 1995; Sorenson et al., 2008) and any companies established more than ten years ago (Covin et al., 1990; Lechner et al., 2006), and thus retained a sample with 181 new ventures.

This data collection approach certainly carries disadvantages. Because we were not able to invite founders personally to participate in our survey, response bias may have been an issue. Consequently, we conducted two checks: we grouped respondents by arrival date and compared early and late respondents with respect to several of our independent and dependent variables using one-way analyses of variance. We additionally checked for non-response bias to the extent that anonymous respondents more closely resemble non-respondents (BarNir & Smith, 2002). On the last page of our questionnaire, we asked our respondents to provide us with the name of their company and their e-mail address. As a result, we were able to compare the 64 anonymous respondents with 104 entrepreneurs who identified themselves. In both comparisons, no significant differences were found.

To further ensure the validity of our data, a research assistant searched the internet for information on those 104 companies that identified themselves and collected all the data which were obtainable and relevant for our study, such as firm age, number of founding team members and employees. The correlations between the self-reported measures and internet data were all highly significant and ranged from .97 ($p < .01$, $N = 41$) for company age to .98 ($p < .01$, $N = 49$) for the number of founding team members.

Even though we took the aforementioned steps to ensure the validity of our data, our approach to data collection definitely resulted in a convenience sample, which may raise representativeness issues. To deal with this, we compared our sample to data from the German Socio-Economic Panel Study (SOEP). The SOEP is a representative household panel survey conducted annually by the German Institute for Economic Research in Berlin and is often used for representative research on German entrepreneurs (Caliendo et al., 2009; Mueller, 2006; Schäfer & Talavera, 2009). We found a high degree of similarity between the entrepreneurs within our sample and the self-employed individuals within the SOEP. The small percentage of female founders (32%) within our sample, for example, is consistent with the 31% self-employed females within the SOEP (Caliendo et al., 2009). Moreover, the observation that self-employed Germans are well educated, with 39% having finished secondary school, is also reflected

by our data. As a result, we are confident that the results of our study are representative, despite our use of a convenience sample.

Our sample strategy also offers certain advantages. By not focusing on a single industry, which is the strategy adopted by many previous studies in the field (Baum et al., 2000; Maurer & Ebers, 2006; Stam & Elfring, 2008), the firms in our sample are diverse. More than 14 different industries, including life sciences, information technology, chemical products, construction, food, financial services, education, media and entertainment are included, which enhances the generalizability of our results (Poppo, Zhou & Zenger, 2008).

After checking for representativeness of our complete sample, we then excluded all ventures that only consist of a single person, since specialization and integration of the relationship management function is only feasible in companies with at least two people. The resulting sub-set comprised 117 young ventures. Similar to the original sample of 181 entrepreneurial companies, enterprises within this sub-set had on average been in business for four years and were founded by two people.

5.3.1 Measures

As there are no objective data available representing the main exploratory and dependent variables in our study, we relied on tailor-made self-reported measures and are quite confident that this approach is appropriate. First, the main concepts focused on in our study are concrete attributes, which are perceived and reported more accurately than psychometric properties (Fuchs & Diamantopoulus, 2009). Second, previous research in entrepreneurship gives broad support for the reliability and validity of self-reported measures (Brush & Vanderwerf, 1992; Lechner et al., 2006; Peng & Luo, 2000). Third, we took several additional steps to further ensure data quality. As described above, we were able to compare several of the self-reported data on firm age and the number of founding team members and employees with internet sources and found a very high degree of congruence. In addition, we conducted Harman's one-factor test to check for common method bias. Five distinct factors were extracted, accounting for 74 percent of the total variance. With the first factor explaining 20 percent of the variance, no one factor accounted for most of it; hence, common method bias should not be an issue in our study.

5.3.1.1 Dependent Variables

The dependent variables in our study are all network-related. To collect these network data from a target population of entrepreneurs, whose relations are not concentrated in one single social structure (Greve & Salaff, 2003), we followed an ego-centered approach. Specifically, we asked our respondents—as focal actors at the center of their network—to describe their network relationships (Knoke & Kuklinski, 1982; Knoke & Yang, 2008; Wasserman & Faust, 1994). This approach may be inferior to also asking a focal actor's network partners about their relationship perception. It was, however, the only one feasible as we were not able to personally contact most of our respondents. Additionally, research results in the field of buyer-supplier relationships indicate that exchange partners usually have consistent perceptions regarding their relationships (Anderson & Narus, 1990; Poppo et al., 2008; Zaheer, McEvily & Perrone, 1998).

Within our questionnaire, we first provided our respondents with a definition of the relationships in which we were interested. Specifically, we followed Lecher, Dowling and Welpe (2006) and asked our respondents to think about relationships to partners, either individuals or organizations outside the new venture, who provide resources within an exchange relationship that goes beyond a simple market exchange. To give our respondents additional information about the focus of our research, followed Zhao and Aram (1995) and specifically asked for three different types of partners. In particular, we distinguished partners according to the resources they offer and asked for partners providing several kinds of resources: (1) financial capital; (2) physical resources, such as facilities, equipment or manpower; and (3) knowledge and information.

To capture *network size*, we therefore constructed three items corresponding to the three categories and asked our respondents to indicate how many network partners they have in each of these three categories. We then generated a measure for network size by adding the three item scores. Similarly, we generated a measure for the *number of new network partners* by asking how many new relationships providing financial capital, physical resources and knowledge and information they have newly established since founding their venture and then adding the three item scores. To capture the *number of relationships dissolved by the new venture*, we also generated and aggregated three items asking how many network relationships new venture members have dissolved since founding the business. When constructing the last set of items, we explicitly used the phrase "dissolving a relationship" to account for the distinction between just temporarily deactivating a tie, which may be re-activated in the future if needed (Jack, 2005),

and dissolving a tie, which means that one does not intend to re-enter into an exchange relationship with the former partner in the future (Elfring & Hulsink, 2007).

5.3.1.2 Independent Variables

We measured *specialization* and *integration in relationship management* with two items that we developed according to the concept descriptions presented in our theory section.

To capture the degree to which the relationship management of a new venture is specialized, we asked our respondents to indicate on a 7-point scale, from "1–strongly disagree" to "7–strongly agree", whether "new venture members involved in relationship management are exclusively assigned to manage specific groups of network partners, such as partners providing financial capital or alliance partners".

To measure integration of relationship management, we asked our respondents to indicate on the same 7-point scale whether "new venture members involved in relationship management report regularly about the relationships for which they are responsible".

5.3.1.3 Controls

We additionally included several control variables in our study that might affect the size of a new venture's network, the number of new network relationships established or the number of relationships dissolved by the new venture.

As the size of the network that can be managed by a new venture is affected by the number of people within the venture (Batjargal, 2006), we controlled for both the *number of founding team members* and the *number of employees* of the new business.

Because younger firms typically have less organizational reputation (Hite & Hesterly, 2001), have a smaller resource base (Stam & Elfring, 2008), and may therefore find it more difficult to attract new partners, we controlled for *firm age*.

Recognizing that the development of a new firm's network is at least in part the result of a strategic decision (Koka et al., 2006), we additionally controlled for two aspects of network motivation. Following recent research on the development of entrepreneurial networks (Batjargal, 2006), we controlled for the firm's *resource needs* by asking respondents about the extent to which they would suffer from resource deficits if they did not have external partners who

provided these resources. In addition, we controlled for a firm's *attitude towards networking* (Neergaard & Madsen, 2004) by asking our respondents to indicate the degree to which they perceived networks to be helpful for their corporate development.

To take into account that companies operating in industries with different technological environment differ with respect to the their network size as well as network change over time (Rosenkopf & Schilling, 2007), we also included a dummy variable indicating whether a young venture operates in a *high-technology industry* (such as life sciences, IT and communication, engines, motor vehicles) or a relatively low-technology industry (such as construction, food, financial services, education).

Finally, we included the number of *pre-existing network relationships* (network relationships a new venture already had when the new venture was founded) when analyzing the impact of our independent variables on network change. We did so for two reasons. First, as the value of initially held relationships tends to decrease in the course of corporate development (Hite & Hesterly, 2001), the number of relationships dissolved will probably be positively affected by the number of network partners a new venture had at the time it was founded. Second, as described above in detail, we expect the number of pre-existing partners to have a negative effect on the number of new relationships established by a new venture. With the number of pre-existing relationships that are still active being a subset of the actual network size of a new venture, we however decided not to include this control variable in our third set of regressions.

5.3.2 Analytical Approach

We tested our hypotheses by using hierarchical moderated regression analysis, which allows us to compare alternative regression models with and without interaction terms. The interaction effect is tested by analyzing how significantly it contributes to explaining the variance of our dependent variables (Jaccard, Teitel & Turrisi, 2003).

As recommended by Aiken and West (1991) and Frazier, Tix and Barron (2004), we mean-centered and standardized our control variables as well as our independent variables to account for different measurement scales. We then formed the interaction term by multiplying our measures of specialization and integration of relationship management. Computing our regression, we first entered the control variables before testing the isolated effects of our independent variables in the second step. In the third step we included the interaction term to

test our hypotheses. For all of the models, we computed several regression diagnostics and checked the variance inflation factors (VIF) to exclude multicollinearity.

5.4 Results

Descriptive statistics and the correlations between our variables are provided in Table 5.1.

Table 5.1: Means, Standard Deviations and Correlations

N= 117	Mean	SD	1	2	3	4	5
1. Network Size	4.75	6.23	1	.842*	.444*	.264*	.231*
2. New Relationships	3.62	5.55		1	.503*	.164	.174
3. Relationships dissolved	1.10	2.40			1	.012	-.053
4. Specialization	4.21	2.08				1	.353*
5. Integration	3.28	2.29					1
6. Firm Age	4.15	2.77					
7. Number of Founders	2.19	1.10					
8. Number of Employees	7.59	22.48					
9. Attitude Networking	5.07	2.00					
10. Resource Needs	3.25	1.53					
11. High-Tech Industry	.61	.49					
12. Pre-existing Relationships	1.12	3.37					

* Correlation is significant at the 0.05 level (2-tailed)

Table 5.1: Means, Standard Deviations and Correlations (Cont.)

N= 117	6	7	8	9	10	11	12
1. Network Size	-.019	.019	.000	.251*	.279*	-.162	.461*
2. New Relationships	.023	-.034	.016	.219*	.260*	-.178	-0.90
3. Relationships dissolved	-.021	-.073	.004	.078	.229*	-.046	-.008
4. Specialization	.008	.242*	.196*	.259*	.167	-.055	.217*
5. Integration	-.199*	.242*	.196*	.471*	.124	-.055	.141
6. Firm Age	1	-.163	.163	-.261*	-.219*	.197*	-.072
7. Number of Founders		1	.173	.230*	.212*	.106	.091
8. Number of Employees			1	.047	-.044	.108	-.025
9. Attitude Networking				1	.342*	.036	.104
10. Resource Needs					1	-.046	.088
11. High-Tech Industry						1	-.006
12. Pre-existing Relationships							1

* Correlation is significant at the 0.05 level (2-tailed)

As we have already described earlier, the average venture in our study had been in business for four years, was founded by two people and had eight employees. The typical network comprised five partners. On average, every young venture

had already dissolved one prior network relationship. As also shown in Table 5.1, some of the variables in our study turned out to be significantly correlated. These include the total number of partners and the number of new relationships established (r = .842, p < .05), as well as the number of new partners and the number of relationships dissolved by the young venture (r = .503, p < .05). The independent variables are also significantly positively correlated (r = .353, p < .05), indicating that young ventures specializing their relationship management also tend to integrate their relationship management activities.

Table 5.2: Results of Hierarchical Regression Analyses

***N* = 117**	**New Relationships**			**Relationships Dissolved**			**Network Size**		
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**
Constant	3.988**	3.973**	3.493**	1.127*	1.159**	.948^{+}	5.035**	4.959**	4.350**
	(1.045)	(1.048)	(1.051)	(.476)	(.481)	(.517)	(1.158)	(1.146)	(1.149)
Firm Age	.288	.278	.305	.017	.011	.023	.260	.234	.268
	(.193)	(.195)	(.191)	(.088)	(.089)	(.088)	(.247)	(.216)	(.212)
Number of Employees	.141	.066	.052	.087	.079	.073	.050	-.096	-.106
	(.503)	(.510)	(.501)	(.229)	(.234)	(.230)	(.567)	(0.566)	(.554)
Number of Founders	-.465	-.603	-.592	-.321	-.306	-.301	-.275	-.531	-.521
	(.533)	(.541)	(.530)	(.243)	(.248)	(.244)	(.600)	(.601)	(.588)
Attitude Networking	1.168*	.816	1.076^{+}	.065	.161	.276	1.352*	.814	1.122^{+}
	(.536)	(.594)	(.594)	(.244)	(.272)	(.273)	(.603)	(.660)	(.658)
Resource Needs	1.317*	1.320*	1.355*	.607*	.589*	.604*	1.433*	1.398*	1.437*
	(.528)	(.531)	(.521)	(.240)	(.244)	(.240)	(.595)	(0.590)	(.578)
High-Technology Industry	-2.241*	-2.039^{+}	-2.064*	-.143	-.169	-.180	-2.265^{+}	-1.920^{+}	-1.955^{+}
	(1.028)	(1.035)	(1.015)	(.468)	(.475)	(.467)	(1.158)	(1.150)	(1.125)
Pre-existing Relationships	-.190	-.234	-.261^{+}	-.014	-.009	-.021^{+}			
	(.146)	(.149)	(.147)	(.066)	(.068)	(.067)			
Specialization		.529	.257		.027	-.093		1.049^{+}	.705
		(.559)	(.562)		(.257)	(.258)		(.612)	(.615)
Integration		.545	.862		-.255	-.086		.685	1.054
		(.583)	(.589)		(.267)	(.271)		(.647)	(.651)
Interaction Spec/Integr			1.195*			.526*			1.411*
			(.529)			(.243)			(.130)
R²	.161	.179	.217	.071	.077	.116	.145	.187	.229
ΔR²	.161	.018	.038	.071	.006	.039	.145	.041	.042
adjusted R²	.107	.110	.143	.012	.000	.033	.099	.127	.164

Standard errors in parentheses; $^{+}$ p < .10; * p < .05; ** p < .01

Table 5.2 shows the results of our regression analysis. With respect to our control variables, the regression results reveal that the two variables capturing network motivation have a positive significant effect on our dependent variables. This means that young ventures that depend heavily on resource support from their partners and with a positive attitude towards network relationships hold larger networks with more new partners and have also dissolved more network

relationships than other ventures. Additionally, our results also show that ventures operating in high-technology fields tend to establish fewer new network relationships and have fewer network partners in total.

When including our separate measures of specialization and integration into our regressions, we observe that both variables alone have—with exception of the marginal significant effect of specialization on network size ($\beta = 1.411$, $p < .10$)––no significant impact on our dependent variables.

In contrast, entering the interaction terms representing a specialized and integrated relationship management into our analysis lead to a different picture. As revealed by the ΔR^2-statistics that range from .038 (Model 3) to .042 (Model 9), including the interaction term in the regression considerably increases the amount of variance explained by our regression models. Moreover, the regression results show that the interaction term has a significant impact on all three dependent variables. In particular and as stated by our hypotheses, we observe a positive, significant effect from a specialized and integrated relationship management on (1) the number of new network relationships established ($\beta = 1.195$, $p < .05$); (2) the number of relationships dissolved ($\beta = .526$, $p < .05$) and (3) the total number of network relationships held by a new venture ($\beta = 1.411$, $p < .05$).

5.5 Discussion

It is widely recognized that most entrepreneurs rely on support granted by their networks to succeed in founding and developing their new venture (Davidsson & Honig, 2003; Jarillo, 1989; Stuart et al., 1999). Networks of new ventures have to change in the course of their development to meet the demands of evolving resource needs and sustain growth (Hite & Hesterly, 2001; Lechner et al., 2006; Maurer & Ebers, 2006). To date, however, only a few quantitative studies have explicitly addressed network change as a dependent variable. Additionally, we know little about what founders may actively do to enhance the development of their network (Hite, 2005; Stuart & Sorenson, 2007). The present study addresses this gap in research. Based on prior qualitative research in the field, we develop and test hypotheses on how applying the basic means of organization design—namely specialization and integration—to the relationship management of young ventures affects network change in terms of its two primitives—the creation and dissolution of ties (Koka et al., 2006)—as well as the overall effect on network size.

The results shown provide significant support for our hypotheses. In sum, we find confirming evidence for the proposition that assigning members of a young enterprise to concentrate on interacting with a specific type of network partner and internally communicating relationship management issues on a regular basis fosters network change and enables young ventures to manage larger networks.

In particular, we see that a specialized and integrated relationship management has a positive effect on the number of new relationships established by a new venture. This supports our theoretical argument that a specialized and integrated relationship management may help new venture members to change their frames of reference and increase their ability to understand the perspective and mind-set of potential partners, thus fostering new relationship development. Our results also show that specialization alone is not enough to increase a new venture's capability to establish new network relationships. Instead, a significant effect on the number of new exchange relationships established may only be observed when relationship management issues are discussed internally, so that partner-related knowledge may be combined with the perspectives of other new venture members.

Moreover, we also observe a positive effect of a specialized and integrated relationship management on the number of relationships dissolved by a new venture. This provides support for our argument that introducing a specialized relationship management may lead to a more business-oriented assessment of the value of existing relationships and may help to overcome relational lock-in. Again, however, we see that 'professionalizing' relationship management by means of specialization is not sufficient. Rather, and in line with our reasoning, it seems necessary that relationship management issues are also discussed internally.

Finally, our results show that a specialized and integrated relationship management leads to a positive overall effect on network size. This supports our proposition that young ventures with a specialized and integrated relationship management are not only better able to establish new relationships and dissolve existing ones, but are also capable of effectively managing a larger network. It underlines that applying the principles of organization design to the relationship management of young ventures may indeed help to avoid controversies and conflicts within exchange relationships, thus enhancing interaction efficiency and young ventures' network management capacity.

5.6 Limitations and Conclusion

As its main contribution, the present study extends theory on young ventures' network change. Drawing on previous qualitative work in the field, we provide theoretical arguments as well as empirical evidence for the proposition that a specialized and integrated relationship management positively impacts network change: it fosters new relationship development and the dissolution of pre-existing ties and has a positive overall effect on new ventures' network management capacity. As implied by our theoretical reasoning, these results also provide indirect evidence for the notion that change of new ventures' network may in general be negatively affected by cognitive- and relational-based tendencies of network inertia. Finally, the results presented bear practical implications for the management of young ventures. They imply that young ventures should apply the basic means of organization design and implement a specialized and integrated relationship management if they face a distinct need for network change and seek to increase their network management capacity.

It is worth keeping in mind some limitations of this study. Beside the limitations already discussed in the methods section, we further acknowledge that the cross-sectional design of our study may raise the issue of causality. One could therefore reverse the interpretation of the pertinent results and say that an increasing degree of network change and a greater number of network relationships is not a consequence of specialized and integrated relationship management but its cause. This reverse causality, however, would not necessarily make our arguments less substantive. Even when young companies choose to apply the basic means of organization design to their relationship management to successfully deal with the challenge of managing a growing and more rapidly changing network, our hypotheses that a specialized and integrated relationship management makes young ventures more effective in mastering these challenges would still hold.

Finally, we acknowledge two limitations of our study that should be addressed by further research. First of all, we only considered specialization in terms of an assignment of young venture members to manage specific types of network relationships. As an alternative, a functional form of relationship management specialization may also be possible. Specifically, one member of the new venture could be responsible for initiating new relationships while others manage existing ones. Second, we were not able to test whether our network variables mediate a positive effect of a specialized and integrated relationship management

on new venture performance, as proposed by Maurer and Ebers (2006). This proposition will need to be addressed in further research.

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