

**DO SOCIAL NETWORKS AFFECT ENTRPRENEURSHIP? A  
TEST OF THE FUNDAMENTAL ASSUMPTION USING LARGE  
SAMPLE, LONGITUDINAL DATA**

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# **DO SOCIAL NETWORKS AFFECT ENTREPRENEURSHIP? A TEST OF THE FUNDAMENTAL ASSUMPTION USING LARGE SAMPLE, LONGITUDINAL DATA**

## **ABSTRACT**

This study empirically tests the assumptions that most research into entrepreneurial networks are based upon. Empirical data were drawn from Australia's participation in the Global Entrepreneurship Monitor project (GEM) from 2000-2005 – an aggregate sample of 14,205 randomly selected Australians. The study demonstrated: (1) statistically significant differences in social networks when entrepreneurs and non-entrepreneurs are compared and (2) that the structural diversity of social networks changes during the entrepreneurial process. It was found that structural diversity was most important to entrepreneurs in the discovery stage, least important to entrepreneurs in the start-up stage and of medium importance to entrepreneurs in the young business stage.

**Keywords:** *entrepreneurship, social network, structural diversity, Global Entrepreneurship Monitor (GEM), the entrepreneurial process*

## **INTRODUCTION: THE IMPORTANCE OF SOCIAL NETWORKS**

Every research domain can benefit from occasional reflection upon fundamental assumptions.

This study was designed to test some fundamental assumptions underpinning most social network research conducted in the field of entrepreneurship.

Recent entrepreneurship literature has changed from viewing entrepreneurs as autonomous and rational decision makers toward viewing entrepreneurs as embedded in social networks (Aldrich & Zimmer, 1986; Hoang & Antoncic, 2003; O'Donnell, 2001). As a reaction to the former atomistic and under-socialized view of the entrepreneur often taken in the psychological perspective (e.g. Brockhaus 1980; Brockhaus 1982; Brockhaus and Horwitz 1986), an increased recognition of the importance of social networks has developed since the mid eighties. The entrepreneurial network approach assumes that people with whom entrepreneurs interact affect entrepreneurs' endeavours - basically through the various resources different relationships provide. It embeds entrepreneurship in a social and institutional context and tries to provide entrepreneurship research with a way to encompass the range of important factors spanning the autonomous, independent entrepreneur to the

social embedded entrepreneur (see Araujo & Easton (1996), O'Donnell et al. (2001) or Hoang & Antoncic (2003) for comprehensive reviews).

Social networks (in diverse ways) provide entrepreneurs with a wide range of valuable resources not already in their possession and help them achieve their goals (e.g. Hansen, 1995; Jenssen, 2001; Jensen & Greve, 2002; Jenssen & Koenig, 2002; Singh, 2000). The resources entrepreneurs obtain from networks involve a whole range of variations (e.g. Foss 1994; Jenssen 1999; Jenssen 2001; Jenssen and Koenig 2002; Ripolles and Blesa 2005).

Among the most important resources that networks can provide are:

- information (sensible as well as non-sensible, diverse as well as non-diverse);
- access to finance;
- access to skills, knowledge and advice (all aids to competency);
- social legitimacy.

Although difficulties exist in terms of how to measure social capital, it is more and more often argued that social capital is the value generated by social networks (Burt 1997). Burt argues that capital can be divided into three categories. Human capital is the knowledge and capacity within human beings; financial capital is the money in people's pockets; and social capital is the value of resources generated by people's social networks (Burt 1992).

Many previous empirical studies have investigated the impact of social networks in different contexts. Some have investigated specific industries (e.g. Elfring and Hulsink, 2001; Perren, 2002; Neergaard and Madsen, 2004; Neergaard, 2005) and some have investigated specific regional areas (e.g. Aldrich et al., 1989; Johannisson and Monsted, 1997; Manev et al., 2005). Accordingly, it could be argued that the field, in general, is biased toward studying social networks in specific context, whereas the ambition to draw general conclusions is less present. Often contextually constrained studies are completed due to lack of research resources. Sometimes, context limitation is a conscious choice due to epistemological interest and focus.

Unfortunately, many studies that seek to transcend narrow contextual constraint in favour of explaining the generic and universal impacts of social networks on

entrepreneurship, often employ samples that are inadequate for the grand purpose. Randomly selected or representative samples have not always been applied (e.g. Woodward, 1988; Foss 1994; Jenssen, 1999; Dodd and Patra, 2002). Dodd and Patra (2002), for instance, for convenience reasons, used students from their entrepreneurship classes to identify and recruit entrepreneurs for their survey. Foss (1994), although her interest was in the generic nature of entrepreneurship, identified her sample from the cod farming industry in Norway.

Another critique that could be applied to most previous studies in this field is that they investigate *how* social networks influence entrepreneurship. Making a too-bold assumption, they tend to ignore the more fundamental question of *whether* social networks have any influence at all. The authors of this paper began this study with the assumption that social networks impact entrepreneurship. However, we also began with the belief that assumptions need to be empirical tested. There are very few studies using appropriate representative samples and suitable control groups that could be said to have investigated whether social networks impact entrepreneurship (Samuelsson, 2001; Davidsson and Honig, 2003; Liao and Welsch).

This paper investigates the potential impact of social networks on entrepreneurship through examination of a representative sample of Australian adults, including both entrepreneurs and a control group of non-entrepreneurs. The impact is investigated for three different stages of the entrepreneurial process. In the next section of the paper, hypotheses are developed followed by a description of the methodology applied. In subsequent sections, the findings are presented before final conclusions and discussions are presented.

## **HYPOTHESES DEVELOPMENT**

### ***From a Plethora of Choice to a Single Measure***

The concept of 'social networks' is a complex, multi-faceted phenomenon. It has been described and operationalized in many different ways but a useful approach is to view social networks as consisting of three key dimensions: structural, relational (Granovetter, 1992) and cognitive (Nahapiet and Ghoshal, 1998). Each dimension is itself a composite of many

variables. The structural dimension focuses on the overall pattern of connections between actors, e.g. presence or absence of tie, network configuration, and morphology (e.g. size, density, connectivity or hierarchy). The relational dimension focuses on the kinds of relationships people have developed with each other through a history of interaction. The cognitive dimension focuses on shared representations, interpretations and system of meaning among actors within the network.

The depth and diversity of variables contained within the three-dimensions approach to social networks means that social networks can be described and examined in a wide variety of ways depending upon the emphasis given to different dimensions and variables comprising the phenomenon. Any particular investigation in the complex area of social networks therefore needs to articulate with great clarity the particular choice of dimension(s) and variables that the study addresses. The study reported in this paper, focused on the structural dimension and was limited to measuring a single variable representing the construct of 'structural diversity' (a construct which could be measured in variety of ways different from the manner it was treated in this study).

In previous literature, many different variables of the structural dimension of social networks have been argued to impact upon entrepreneurship (see Hoang and Antoncic (2003) and O'Donnell (2001) for comprehensive reviews). Some of these variables include network size, network density, structural holes<sup>1</sup> and structural diversity. This paper focuses on structural diversity. The major limitation is that the data set used only contains one question bearing partially on the issue of structural diversity. The exact question producing a variable we call 'networking' is: 'Do you know someone personally who started a business in the past 2 years?' We argue that the answer to this question is a good measure of the structural diversity aspect of social networks.

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<sup>1</sup> Structural holes in networks appear when certain actors function as brokers between groups of actors who, without the broker, would remain disconnected (Burt 1992).

### *Development of Hypotheses*

Some people have entrepreneurs in their social networks and some do not. Personal knowledge of an entrepreneur has been shown to be associated with a statistically significant increase in the likelihood that a person undertakes entrepreneurship him or herself (Hindle and Rushworth, 2001; Klyver and Schøtt, 2004). It may be assumed that people who have entrepreneurs in their social networks have access to valuable resources. These resources vary and include: knowledge on the start-up processes; access to business contacts; and emotional support from people with similar career interests. These resources are less obtainable by people without entrepreneurs in their social networks.

*Hypothesis 1:* Belonging to a social network that includes one or more entrepreneurs increases an individual's likelihood of being an entrepreneur.

Entrepreneurs face a lot of challenges that have to be managed throughout the entrepreneurial process. For measurement purposes it is usual to distinguish different broad-level stages in the continuous process of entrepreneurship as though they were synonymous with precise stages of a business life cycle. Challenges differ due to where in the entrepreneurial process (i.e. at what stage of a venture's life-cycle) the entrepreneur operates (Davidsson and Honig, 2003; Greve and Salaff, 2003; Ewald et al. 2006). Entrepreneurs, therefore, rely on different compositions of social networks in different stages of the entrepreneurial process. It is a well-demonstrated fact that social networks are dynamic. However, the manner in which any given social network actually develops through the entrepreneurial process – the key issue of *how?* – has never been satisfactorily investigated. Nevertheless, emerging results indicate that entrepreneurs searching for business opportunities rely heavily on *diverse* social networks consisting of many 'structural holes' and weak ties (e.g. Ardichvili and Cardozo, 2000; Singh, 2000; Puhakka, 2002; Davidsson and Honig, 2003; Klyver, 2004b; Klyver, 2006). Later, at the stage when they are about to

finally decide to start or not or are searching for external finance, entrepreneurs rely more heavily on *dense* networks often including a high proportion of family members. *Close* ties, such as those often involved in family membership, provide emotional support surrounding the stressful decision about whether to start a new venture or not (Larson and Starr, 1993; Brüderl and Preisendörfer, 1998; Greve and Salaff, 2003; Klyver, 2004c; Klyver and Schøtt, 2004; Anderson et al., 2005; Neergaard et al., 2005). Furthermore, family members are the most frequent informal investors in new ventures (Bygrave et al., 2003). There is a third stage (the final stage considered in this study). It occurs after a business has been started at the time when the entrepreneur or entrepreneurs need to create the conditions for sustainability in a market place. At this stage, they return to reliance upon *diverse* (rather than *dense*) social networks that again include structural holes and many weak ties (Larson and Starr, 1993; Greve, 1995; Havnes and Senneseth, 2001; Hite and Hesterly, 2001). However, social networks at this stage are more embedded into a business context than before (Larson and Starr, 1993; Evald et al., 2006). In summary, previous research strongly indicates that social networks change dynamically during the entrepreneurial process. Accordingly, existing studies support the proposition that the effect of having entrepreneurs in the social network will change during the entrepreneurial process.

*Hypothesis 2:* The likelihood among entrepreneurs that they will have other entrepreneurs in their social networks varies at different stages of the business life cycle.

## **METHODOLOGY**

### ***Data Set***

The Australian GEM database including pooled data from the years 2000-2005 was the empirical base used to test the two hypotheses developed above.

The Global Entrepreneurship Monitor (e.g. Reynolds, Bygrave & Autio, 2004; Minniti et al. 2006) is an international project trying to detect whether and to what extent

entrepreneurial activity varies across countries; what makes a country entrepreneurial; and how entrepreneurial activity affects a country's rate of economic growth and prosperity. Australia has participated in this global research project since 2000 (e.g. Hindle and O'Connor, 2005; Hindle and Klyver, 2006). This participation has generated an extensive database on a wide range of issues and factors germane to Australian entrepreneurship. Every calendar year, each participating nation completes a GEM National Population Survey embracing a minimum of 2000 *randomly selected* adult respondents who are asked a variety of questions regarding their engagement and attitude towards entrepreneurship. The cumulative number of GEM Australia respondents for the six years (2000-2006) is 14,205 people. Some are classifiable as entrepreneurs; some are not.

A contentious discussion takes place in entrepreneurship research concerning the definition and operationalisation of entrepreneurship. Broadly, this discussion can be divided into two perspectives. The first perspective (the opportunity perspective) argues that entrepreneurship is about discovery, evaluation, and exploitation of opportunities (Venkataraman, 1997; Shane & Venkataraman, 2000, Eckhardt & Shane, 2003). It puts emphasis on entrepreneurship as a disequilibrium activity. The second perspective (the emergence view) regards entrepreneurship as 'firm emergence' or 'firm creation' (Gartner 1993). It emphasises evolutionary and dynamic aspects of entrepreneurship and focuses on organizing activities in a Weickian sense (Davidsson 2004). For its analytical purposes, the study reported in this paper took a very broad emergence perspective and focused on participation in ownership of new ventures. In this paper entrepreneurship is regarded as behaviour associated with creating new organisations regardless of degree of the five other factors which GEM measures: motivation, innovation, growth orientation, financial sophistication and the entrepreneurial capacity of founders (Hindle 2006).

In a subsequent section describing variables employed in the analysis, the precise questions used to classify entrepreneurs are presented. This classification divides entrepreneurs into three categories: those who operate in the early *discovery stage* (trying to recognize a business opportunity to pursue); those operating in the *start-up stage* (actively

trying to start a business); and those running a young business operating in the *young business stage*.

### ***Analytical techniques***

The empirical data were analysed using SPSS version 12.0.1 for Windows. In order to test the two hypotheses, the most appropriate statistical techniques were chi square tests (Knoke, Bohrnstedt & Mee, 2002) and logistic regression (Hosmer and Lemeshow, 2000).

### ***Description of Variables***

#### **Dependent variables**

Three dependent variables were utilised in this study. All three variables have to do with engagement in entrepreneurship at different stages of the entrepreneurial process: discovery stage, start-up stage and young business stage.

*Discovery stage:* People who within the next three years alone or with others expect to start a new business, including any type of self-employment.

*Start-up stage:* People who alone or together with others are trying to start an independent new business or a new venture together with their employer. This must be a business or venture they have been actively trying to start, will own all or part of, and from which they have not received salary for more than three months.

*Young business stage:* People who alone or together with others currently are owner(s) of a business they help to manage, are self-employed, or are selling goods or services to others. In order to qualify for the young business stage the owners may not have received salary for more than 42 months.

#### **Independent variables**

The GEM Australia data set used for this study contained questions capable of producing measures of the 5 independent variables classified below.

*Networking:* People who personally know someone who has started a business in the past two years. This is the variable that is at the heart of our investigation. The point of the

statistical testing conducted in this study was to try to determine the effects of networking (isolated from the compounding influence of other factors) upon the three dependent variables. The remaining independent variables function as control variables.

*Gender:* Peoples' gender was coded 1 for male and 2 for female. The entrepreneurial network literature indicates that gender influences entrepreneurial networking. Although results from all studies are still not thoroughly consistent, predominant emerging results indicate that female entrepreneurs have different social network than male entrepreneurs (e.g. Aldrich et al., 1989; Cromie and Birley, 1992; Aldrich et al., 1997; Renzulli et al. 2000; Weiler and Bernasek, 2001; Carter et al., 2003; Greve & Salaff 2003; Neergaard et al. 2005).

*Age:* A respondent's exact age was recoded into two dummies – one for the age group between 30 and 49 years old and another for the age group over 50 years old. Younger than 30 years old is the dummy reference. Previous literature shows that age affects how entrepreneurs use and activate their social networks (e.g. Renzulli et al., 2000; Greve and Salaff, 2003). Entrepreneurs' age influences the resources already in their possession, and thus, the resources entrepreneurs need to obtain from their social networks. Entrepreneurs' age may also influence the generation of the general network from which resource persons can be activated.

*Competence:* This variable describes people who have the knowledge, skill and experience required to start a new business. Entrepreneurship literature argues that competence (otherwise called 'human capital') impacts entrepreneurship (Evans and Leighton, 1989; Bellu et al., 1990; Honig, 1996; Gimeno et al., 1997; Reynolds, 1997; Bosma et al., 2000; Davidsson & Honig, 2003). The purpose of social networking is to gain access to resources not already held by the entrepreneurs. Thus, competence impacts which resources are needed and thus how social networking is practiced.

*Alertness:* people who think in the next six months there will be good opportunities for starting a business in the area where they live. Discoveries of new opportunities are crucial to the entrepreneurial process (e.g. Stevenson & Jarillo, 1990; Venkataraman, 1997; Shane &

Venkataraman, 2000; Eckhardt & Shane, 2003; Davidsson, 2004). Being alert to opportunities seems to have a positive impact on entrepreneurship (e.g. Kirzner, 1997; Ardichvile & Cardozo, 2000). Entrepreneurial networking is a way of stimulating alertness. Research has shown that social networks are important, influential factors in opportunity recognition (Hills et al., 1997; Ardichvili and Cardozo, 2000; de Konig, 2000; Singh, 2000; Puhakke, 2002)

## **FINDINGS**

### ***Bi-variate statistical results***

Table 1 shows the impact of having an entrepreneur as a member of a person's social network. The statistical chi-square tests reveal the following information for the three different stages of the entrepreneurial process. In the discovery stage, people with entrepreneurs in their social network have 3.6 times higher odds of being an entrepreneur than people without entrepreneurs in their social networks. In the start-up stage, people with entrepreneurs in their social network have 3.0 times higher odds of being an entrepreneur. In the young business stage, people with entrepreneurs in their social network have 2.7 times higher odds of being an entrepreneur.

Table 1: Importance of networking in different stages of the entrepreneurial process.

<b>Stages in the entrepreneurial process</b>	<b>Networking<sup>3)</sup></b>	<b>Not networking<sup>3)</sup></b>	<b>Odds ratio</b>
<b>Discovery<sup>1)</sup></b>	22.9 %	7.6 %	3.6
<b>Start-up<sup>2)</sup></b>	10.6 %	3.8 %	3.0
<b>Young business<sup>2)</sup></b>	8.2 %	3.2 %	2.7

Source: GEM population survey of adults in Australia 2000-2005.

Notes:

- 1) Only data from 2002-2005 were available (N=7650)
- 2) N=14205
- 3) Chi2 tests reveal that differences between networking and non-networking adults are significant on a 0.0005 level for all three stages of the entrepreneurial process.

For all three stages of the entrepreneurial process, the chi-square analyses were highly significant (at the 0.0005 level). The discovery stage result was based on 7,650 respondents

from the GEM Australia Adult Population Survey 2002-2005. Prior to 2002, the discovery stage variable was not collected. The start-up stage and the young business stage results were based on 14,205 respondents from the GEM Australia Adult Population Survey 2000-2005.

The empirical results contained in table 1 confirm that those social networks that include entrepreneurs increase peoples' odds of being an entrepreneur. Accordingly, table 1 results support hypothesis 1. They also support hypothesis 2 because they indicate that the effect of having entrepreneurs in a social network varies at different stages of the entrepreneurial process.

### *Multivariate statistical results*

However, before any conclusions can be drawn, it is essential to test whether the correlations remain significant when appropriate control variables are put into the equation. In the methodology section, it was argued that a range of additional variables might be expected to influence participation in entrepreneurship at different stages of the entrepreneurial process. Logistic regressions, in table 2, test the relationship between networking and participation in entrepreneurship controlling for other relevant variables.

Table 2: Logistic regression: Important of networking

	<b>Discovery</b>		<b>Start-up</b>		<b>Young</b>	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
<b>Networking</b>	0.81 ****	2.25	0.61 ****	1.85	0.68 ****	1.98
<b>Gender</b>	-0.47 ****	0.63	-0.14	0.87	-0.28 *	0.76
<b>Age</b> (reference is young)						
<b>Mid</b> (30-49 years old)	-0.62 ****	0.54	-0.11	0.90	0.25	1.28
<b>Old</b> (50+ years old)	-1.40 ****	0.25	-0.74 ****	0.48	-0.49 **	0.61
<b>Competence</b>	0.82 ****	2.28	1.47 ****	4.33	1.25 ****	3.49
<b>Alertness</b>	0.77 ****	2.15	0.64 ****	1.90	0.40 ***	1.50
<b>Constant</b>	-1.67 ****	0.19	-3.88 ****	0.02	-3.82 ****	0.02
	N = 6315 R <sup>2</sup> = 0.20		N = 6593 R <sup>2</sup> = 0.13		N = 6593 R <sup>2</sup> = 0.11	

Source: GEM population survey of adults in Australia 2000-2005.

Note:

- \* < 0.05
- \*\* < 0.005
- \*\*\* < 0.001
- \*\*\*\* < 0.0005

Table 2 shows that, of all the variables controlled for in the model, the strongest predictor of entrepreneurship (as defined in this study) is a person's competence: i.e. the person's possession of the knowledge, skills and experience required to start a business. Competence is the strongest predictor regardless of stage of the entrepreneurial process. People who think they have the knowledge, skill and experience required to start a business have 2.28 times better odds of being an entrepreneur in the discovery stage ( $p=0.0005$ ), 4.33 better in the start-up stage ( $p=0.0005$ ), and 3.49 better odds in the young business stage ( $p=0.0005$ ), compared to people who do not think they have relevant competence. Being a female reduces the odds of being an entrepreneur in the discovery stage ( $p=0.0005$ ) and being an entrepreneur in the young business stage ( $p=0.05$ ). Age seems to have a significant negative impact on entrepreneurship, although the relationship is not linear. And finally, alertness also seems to be a strong predictor of entrepreneurship in all three stages ( $p=0.0005$  for discovery stage and start-up stage and  $p=0.001$  for the young business stage).

Table 2, using a multi-variate perspective, confirms the bi-variate results of table 1. All results from table 2 support the principle contention of the study: networking is a strong predictor of whether people engage in entrepreneurship.

The coefficient B for networking is positive, which shows that having entrepreneurs in the social network increases the probability or the odds of being an entrepreneur. The exponential of the coefficient for networking in the discovery stage is 2.25 ( $p=0.0005$ ). It means that people who have entrepreneurs in their network have 2.25 times better odds of being an entrepreneur in the discovery stage compared to people whose networks do not include entrepreneurs. In the start-up stage, the odds of being an entrepreneur are 1.85 times higher for people who have entrepreneurs in their network than for people whose networks do not include entrepreneurs ( $p=0.0005$ ). In the young business stage, the odds are 1.98 times higher ( $p=0.0005$ ). These results give very strong support to hypothesis 1.

The multi-variate empirical results also support hypothesis 2. They show that the impact of having entrepreneurs in social networks varies at different stages of the entrepreneurial process. In the start-up stage, networking with other entrepreneurs increases

the odds of being an entrepreneur by 125%, in the start-up stage by 85 %, and in the young business stage by 98 %. Thus, having entrepreneurs in the social network is most important to entrepreneurs in the discovery stage and least important to entrepreneurs in the start-up stage.

## **CONCLUSION AND DISCUSSIONS**

The intention of this study was to test empirically the assumptions that most research into entrepreneurial networks are based upon. The field of entrepreneurial networks, despite rapid growth importance and legitimacy (Borgatti and Foster, 2003), has forgotten to test the twin assumptions that social networks between entrepreneurs and non-entrepreneurs differ, and that social networks among entrepreneurs differ at different stages of the entrepreneurial process.

The results provided in this study are based on solid empirical data drawn from a representative sample of Australians, where some were classified as entrepreneurs and some were not. The people who were not entrepreneurs constituted a control group. The study showed, with statistical significance, that structural diversity (in social networks) differs among entrepreneurs and non-entrepreneurs and that it changes during the entrepreneurial process.

To entrepreneurs in different stages of the entrepreneurial process, structural diversity is valuable as it provides resources vital to the entrepreneurial process (e.g. Woodward, 1988; Renzulli et al., 2000; Singh, 2000). The empirical results achieved in this study comport strongly the existing knowledge about the manner in which structural diversity evolves during the entrepreneurial process (e.g. Woodward, 1988; Klyver, 2004a; Greve 1995). Structural diversity – measured in this study as knowing people who have started a business within the last two years – is very important to people searching for opportunities in the discovery stage (Ardichvili and Cardozo, 2000; Singh, 2000; Puhakka, 2002; Davidsson and Honig, 2003; Klyver, 2004b; Klyver, 2006; Evald et al., 2006). It is less important in the start-up stage where entrepreneurs prefer to rely on denser networks, including higher proportions of family and social ties (Larson and Starr, 1993; Brüderl and Preisendörfer, 1998; Greve and Salaff,

2003; Klyver, 2004c; Klyver and Schøtt, 2004; Anderson et al., 2005; Neergaard et al., 2005; Evald et al., 2006). However, as entrepreneurs move into the young business stage, structural diversity again increases in importance (e.g. Larson and Starr, 1993; Greve, 1995; Havnes and Senneseth, 2001; Hite and Hesterly, 2001; Klyver, 2004a). Thus, the study takes its importance by its strong confirmatory support of the two fundamental assumptions that entrepreneurial network research is based on.

However, for the purpose of establishing a generic and universal foundation for entrepreneurial network research, the study suffers from two principal limitations. First, the relational dimension and cognitive dimension of social networks were not elaborated in this study. Only one variable attached to the structural dimension was investigated. Social networks involve much more than just the structural dimension and much more than just about knowing people who have started a business within the last two years. Second, the study may be argued to possess a cultural bias (Johannisson and Mønsted, 1997; Dodd and Patra, 2002; Dodd et al., 2002; Greve and Salaff, 2003) because it only analysed *Australian* data.

Thus, the effort to support the foundational assumptions of the research field focused on entrepreneurial networks is not complete. As well as continuing to study the structural dimension in greater depth, future research must look to challenging the foundational assumptions of the other dimensions of the social networks: the relational and the cognitive. Finally, future research also needs to address the key issue of the proportional importance of culture as a driving factor. Are entrepreneurial networks totally culturally determined or are there some transcendent, universal drivers of entrepreneurial networking that work – perhaps in different proportions – in all cultures, nations and circumstances?

## **REFERENCES**

Aldrich, H. E., A. B. Elam, et al. (1997). "Strong ties, weak ties, and strangers - Do women owners differ from men in their use of networking to obtain assistance?" In Birley, S.

- and MacMillan, I. C. (eds) *Entrepreneurship in a global context.* London, Routledge: 1-25.
- Aldrich, H., Reese, P. R., et al. (1989) "Women on the verge of a breakthrough: Networking between entrepreneurs in United States and Italy", *Entrepreneurship and Regional Development*, 1: 339-356
- Aldrich, H. E. and C. Zimmer (1986). "Entrepreneurship through social networks". In Sexton, D. L. and Smilor, R. W (eds) *The art and science of entrepreneurship*, New York, Ballinger: 3-23.
- Anderson, A. R., S. L. Jack, et al. (2005). "The role of family members in entrepreneurial networks: Beyond the boundaries of the family firm." *Family Business Review* 18(2): 135- 154.
- Araujo, L. and G. Easton (1996). "Networks in Socioeconomics Systems". In Iacobucci, D. (eds), *Networks in Marketing.*, SAGA Publications: 63-107.
- Ardichvili, A. and R. Cardozo (2000). "A model of the entrepreneurial opportunity recognition process." *Journal of Enterprising Culture* 8(2): 103-109.
- Bellu, R., Davidsson, P., Goldfarb, C. (1990). *Toward a theory of entrepreneurial behavior: empirical evidence from Israel, Italy, and Sweden.* *Entrepreneurship and Regional Development* 2(2): 195-209
- Borgatti, S. P. and P. C. Foster (2003). "The network paradigm in organizational research: A review and typology." *Journal of Management* 29(6): 991-1013.
- Bosma, N., M. van Praag, et al. (2000). *Determinants of successful entrepreneurship, SCientific AnaLysis of Entrepreneurship and SMEs.*
- Brockhaus, R. H. (1980). "Risk taking propensity of entrepreneurs." *Academy of management Journal* 23(3): 509-520.
- Brockhaus, R. H. (1982). *The psychology of the entrepreneur.* *Encyclopedia of entrepreneurship.* C. A. Kent, D. L. Sexton and K. H. Vesper. Englewood Cliffs, New Jersey, Prentice Hall: 39-57.

- Brockhaus, R. H. and P. S. Horwitz (1986). The psychology of the entrepreneur. In Sexton, D. L. and Smilor, R. W. (eds), The art and science of entrepreneurship.. Cambridge, MA., Ballinger.
- Brüderl, J. and P. Preisendörfer (1998). "Network support and the success of newly founded businesses." *Small Business Economics* 10(3): 213-225.
- Burt, R., S (1992). Structural holes - The social structure of competition. London, Harvard University Press.
- Burt, R., S (1997). "The contingent value of social capital." *Administrative Science Quarterly* 42(2): 339-365.
- Bygrave, W. D., M. Hay, et al. (2003). "Executive forum: a study of informal investing in 29 nations composing the Global Entrepreneurship Monitor." *Venture Capital* 5(2): 101-116.
- Carter, N., C. G. Brush, et al. (2003). "Women entrepreneurs who break through to equity financing: the influence of human, social and financial capital." *Venture Capital* 5(1): 1-28.
- Cromie, S. and S. Birley (1992). "Networking by female business owners in Northern Ireland." *Journal of Business Venturing* 7(3): 237-251.
- Davidsson, P. (2004). *Researching Entrepreneurship*. New York, Springer.
- Davidsson, P. and B. Honig (2003). "The role of social and human capital among nascent entrepreneurs." *Journal of Business Venturing* 18(3): 301-331.
- de Konig, A. (2000). Opportunity formation from a socio-cognitive perspective. In Hills, G. E. and Singh, R. P. (eds), *Research at the marketing/entrepreneurship interface*. Chicago, University of Illinois at Chicago: 17-33.
- Dodd, S. D. and E. Patra (2002). "National differences in entrepreneurial networking." *Entrepreneurship & Regional Development* 14(2): 117-134.
- Dodd, S. D., S. Jack et al. (2002). "Scottish entrepreneurial networks in the international context", *International Small Business Journal*, 20(2):213-219

- Eckhardt, J. T. and S. Shane (2003). "Opportunities and entrepreneurship." *Journal of Management* 29(3): 333-349.
- Elfring, T. and W. Hulsink (2001). "Networks in entrepreneurship: The case of high-technology firms." *Small Business Economics* 21(4): 409-422.
- Evald, M.R., Klyver, K. et al. (forthcoming 2006), "The changing importance of the strength of ties throughout the entrepreneurial process", *Journal of Enterprising Culture* 14(1).
- Evans, D. and Leighton, L. (1989). Some empirical aspects of entrepreneurship. *American Economic Review* 79: 519-535.
- Foss, L. (1994). Entrepreneurship: The impact of human capital, a social network and business resources on start-up. Bergen, Doctoral thesis - The Norwegian School of Economics and Business Administration.
- Gartner, W. B. (1993). "Words lead to deeds: Towards an organizational emergence vocabulary." *Journal of Business Venturing* 8: 231-239.
- Granovetter, M. S. (1992). Problems of explanation in economic sociology. In Nohria, N. and Eccles, R. G. (eds), *Networks and organizations: Structure, form and action*. Boston, Harvard Business School Press: 25-56.
- Greve, A. (1995). "Networks and entrepreneurship - An analysis of social relations, occupational background, and use of contacts during the establishment process." *Scandinavian journal of management* 11(1): 1-24.
- Greve, A. and J. W. Salaff (2003). "Social networks and entrepreneurship." *Entrepreneurship Theory & Practice* 28(4): 1-22.
- Gimeno, J., T. B. Folta, et al. (1997). "Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms." *Administrative Science Quarterly* 42(4): 750-783.
- Havnes, P. A. and Senneseth, K. (2001). A panel study of firm growth among SMEs in networks *Small Business Economics* 16: 293-302.
- Hansen, E. L. (1995). "Entrepreneurial networks and new organizational growth." *Entrepreneurship Theory & Practice* 19(4): 7-19.

- Hills, G. E., G. T. Lumpkin, et al. (1997). *Opportunity Recognition: Perceptions and Behaviors of Entrepreneurs*. Entrepreneurship Research Conference, Babson College.
- Hindle, K. (2006). "A measurement framework for international entrepreneurship policy research: from impossible index to malleable matrix", *International Journal of Entrepreneurship and Small Business* 3(2):139-182
- Hindle, K. and O'Connor (2005). "Westpac GEM Australia – A study of Australian entrepreneurship in 2004", Australian Graduate School of Entrepreneurship Report Series, vol 2, No. 1, Swinburne University of Technology, Melbourne
- Hindle, K. and Klyver, K. (forthcoming) Exploring the relationship between media coverage and participation in entrepreneurship: initial global evidence and research implications, accepted for future publication in *International Entrepreneurship and Management Journal*.
- Hindle, K. and Rushworth, S. (2001). "Yellow Pages® GEM Australia, 2001", Melbourne, Swinburne University of Technology, Swinburne Press
- Hite, J. M. and W. S. Hesterly (2001). "The evolution of firm networks: From emergence to early growth of the firm." *Strategic Management Journal* 22(3): 275-286.
- Hoang, H. and B. Antoncic (2003). "Network-based research in entrepreneurship - A critical review." *Journal of Business Venturing* 18(2): 165-187.
- Honig, B. (1996). Education and self employment in Jamaica. *Comparative Education Review* 40(2): 177-193
- Hosmer, D. W. and Lemeshow, S. (2000). "Applied logistic regression". New York, Wiley
- Jenssen, J. I. (1999). *Entrepreneurial networks - A study of the impact of social networks and resource access on start-up on new organizations*. Kristiansand, Norwegian School of Economics and Business.
- Jenssen, J. I. (2001). "Social networks, resources and entrepreneurship." *International Journal of Entrepreneurship and Innovation* 2(2): 103-109.

- Jenssen, J. I. and A. Greve (2002). "Does the degree of redundancy in social networks influence the success of business start-ups?" *International Journal of Entrepreneurial Behavior & Research* 8(5): 254-267.
- Jenssen, J. I. and H. F. Koenig (2002). "The effect of social networks on resource access and business start-ups." *European Planning Studies* 10(8): 1039-1046.
- Johannisson, B. and M. Mønsted (1997). "Contextualizing entrepreneurial networking - The case of Scandinavia." *International Studies of Management and Organization* 27(3): 109-136
- Kirzner, I. M. (1997). "Entrepreneurial discovery and the competitive market process: An Austrian approach." *Journal of Economic Literature* 35(1): 60-85.
- Klyver, Kim (2004a). "Udvikling i iværksætteres personlige netværk" (Development in entrepreneurs' personal networks), *Ledelse & Erhvervsøkonomi (Management & Business Economics)*, 68(4): 255-264
- Klyver, Kim (2004b) "Firm emergence and social network development", paper presented at RENT XVIII, Copenhagen, 24<sup>th</sup>-26<sup>th</sup> November
- Klyver, Kim (2004c) "Med hjælp fra familien – familiens rolle for iværksætterskab" (With help from the family – the role of family in entrepreneurship), In Bager, T., Svendsen, S. G., Toltild, L. (eds) "CESFOs Yearbook 2003/2004 – growth theme", pp 59-64.
- Klyver, K. (2006). "Action Focus: Using social networks – a guide for entrepreneurs." Australian Graduate School Of Entrepreneurship Research Report Series, vol. 3, no. 7. Melbourne: Swinburne University Of Technology.
- Klyver, K. and Schøtt, T. (2004). "Entrepreneurs' social networks – encouragement or criticism?", paper presented at 24th Babson Kaufman Entrepreneurship Research Conference, Glasgow, 2-5 June 2004
- Knoke, D., Bohrnstedt, G. W. & Mee, A. P. (2002). *Statistics for social data analysis*. Itasca, Illinois: F. E. Peacock Publishers

- Liao, J. and H. Welsch (2005). "Roles of social capital in venture creation: Key dimensions and research implications" *Journal of Small Business Management* 43(4): 345-362
- Larson, A. and J. A. Starr (1993). "A network model of organization formation." *Entrepreneurship Theory & Practice* 17(2): 5-15.
- Manev, I. M., B. S. Gyoshev, et al. (2005). "The role of human and social capital and entrepreneurial orientation for small business performance in a transitional economy." *International Journal of Entrepreneurship and Innovation Management* 5(3/4): 298-318.
- Minniti, M., Bygrave, W. D., et al. (2006) "Global Entrepreneurship Monitor: 2005 Executive report", Babson College and London Business School
- Nahapiet, J. and S. Ghoshal (1998). "Social capital, intellectual capital, and the organizational advantage." *Academy of Management Review* 23(2): 242-266.
- Neergaard, H. (2005). "Networking activities in technology-based entrepreneurial teams." *International Small Business Journal* 23(3).
- Neergaard, H., E. Shaw, et al. (2005). "The impact of gender, social capital and networks on business ownership - a research agenda." *International Journal of Entrepreneurial Behaviour and Research* 11(5): 338-357.
- Neergaard, H. and H. Madsen (2004). "Knowledge intensive entrepreneurship in a social capital perspective." *Journal of Enterprising Culture* 12(2): 105-125.
- O'Donnell, A., A. Gilmore, et al. (2001). "The network construct in entrepreneurship research: A review and critique." *Management Decision* 39(9): 749-760.
- Perren, L. (2002). "The entrepreneurial process of network development in small biotechnology firms: the case of Destiny Pharma Ltd." *International Journal of Entrepreneurship and Innovation Management* 2(4/5): 390-405.
- Puhakka, V. (2002). Entrepreneurial business opportunity recognition - Relationships between intellectual and social capital, environmental dynamism, opportunity recognition behavior, and performance. *Vaasa, Acta Wasaensia*.
- Reynolds, P. (1997). Who starts firms? Preliminary explorations of firms in gestation. *Small Business Economics* 9(5): 449-462.

- Reynolds, P. D., Bygrave, W. D., et al. (2004). *GEM 2003 Global Report*. Kansas City, Missouri: Ewing Marion Kauffman Foundation.
- Ripolles, M. and A. Blesa (2005). "Personal networks as fosterers of entrepreneurial orientation in new ventures." *International Journal of Entrepreneurship and Innovation* 6(4): 239-248.
- Scott, J. (2000). *Social network analysis*. London, SAGE Publications.
- Shane, S. and S. Venkataraman (2000). "The promise of entrepreneurship as a field of research." *Academy of management Review* 25(1): 217-226.
- Singh, R. P. (2000). *Entrepreneurial opportunity recognition through social networks*. London, Garland Publishing, Inc.
- Stevenson, H. H. and J. C. Jarillo (1990). "A Paradigm of Entrepreneurship: Entrepreneurial Management." *Strategic Management Journal* 11(5): 17-27.
- Venkataraman, S. (1997). The distinctive domain of entrepreneurship research: An editor's perspective. In Katz, J. A. and Brockhaus, R. H. (eds) *Advances in entrepreneurship, firm emergence, and growth*. Greenwich, CT, JAI Press: 119-138.
- Weiler, S. and A. Bernasek (2001). "Dodging the glass ceiling? Networks and the new wave of women entrepreneurs." *the Social Science Journal* 38(1): 85-103.
- Woodward, W. J. (1988). *A social network theory of entrepreneurship: An empirical study*. Ann Arbor, Michigan, UMI Dissertation Services.