

# THE ROLE OF INTERPERSONAL TRUST AND VIGILANCE IN THE PROCESS OF ENTREPRENEURIAL OPPORTUNITY RECOGNITION USING SOCIAL NETWORKS

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## ABSTRACT

This research examines the roles that an entrepreneurs dispositions to interpersonal trust, and vigilance play in the process of opportunity recognition. An entrepreneurs use of social networks as a resource in opportunity recognition is also examined. The basis of this investigation was an empirical study of information and communication technology (ICT) entrepreneurs in Queensland, Australia. A series of twelve hypotheses were developed and tested in this research. Despite a modest sample size support was found for six of the hypothesised relationships. An entrepreneurs disposition to both trust and vigilance were found effect the outcomes of their opportunity identification behaviours. A disposition to excess vigilance inhibited the development of entrepreneurial opportunities. While, an extended social network and a trusting disposition were seen to facilitate the development of entrepreneurial opportunities.

## INTRODUCTION

The attempt to identify a specific set of characteristics or to define the psychological profile of a successful entrepreneur has proved fruitless (Smilor, 1997). As a result, recent progress in entrepreneurship research has shifted focus (Gartner, 1988; Low & MacMillan, 1988) from arguments based on an entrepreneurial “*type*”, to studies of the processes which enable the entrepreneurship phenomenon (Ucbasaran et al., 2001), such as opportunity recognition (Shane & Venkataraman, 2000).

One approach to opportunity recognition that is starting to attract attention is based in theories of social capital (Davidsson & Honig, 2003; Senjem & Reed, 2002), and social networks (Hills et al., 1997; Hoang & Young, 2000; Singh, 2000; Singh et al., 1999). Eckhard and Shane (2003) suggest that the reason for this is that the link between explanations for how people discover opportunities and how they use social capital to overcome problems of information asymmetry and uncertainty is more readily facilitated by an opportunity-based explanation of entrepreneurship rather than in a human-type explanation. In addition, the empirical research on opportunity recognition based in social networks has generally supported the theory (Hills et al., 1997; Singh, 2000; Singh et al., 1999).

If we take the social perspective of entrepreneurship. Within their individual businesses, industry sectors, or as part of the wider economic community, entrepreneurs are recognised as more than atomistic economic agents; as the context in which they act is embedded in a network of social relations (Aldrich & Zimmer, 1986). This argument for social embeddedness requires that the study of economic activity must include an examination of the social context within which economic action occurs (Hoang & Young, 2000), since the social dimensions of transactions are central in explaining control and coordination in the exchange (Larson, 1992).

However, trust is not a term which is widely used in the literature which examines the economics of organisation; rather, the focus is on contracting and exchange relationships between self-interested agents (Miller, 2001). Though it has been recognised that trust has real, practical, economic value as it is seen to increase the efficiency of the economic system (Arrow, 1974). In fact, as Dibben (2000) points out, trust is crucial to the development of small business, and organisational emergence.

Previous research has examined trust by employing small business as the setting (Dibben, 2000), however this research aims to explain the processes of entrepreneurship by focusing on trust. While the role that trust plays in entrepreneurial networks has received some theoretical attention (Burt, 1999; Das & Teng, 1998; Larson, 1992; Uzzi, 1997); there is a distinct lack of research investigating the relationship between trust and the specific process of opportunity recognition within entrepreneurship. It is this gap in the literature that this research seeks to address.

## LITERATURE REVIEW

Entrepreneurship has been defined as the discovery, evaluation and exploitation of future goods and services (Venkataraman, 1997). A process which is characterised by the pursuit of opportunity (Stevenson & Jarillo, 1990). Consequently, an entrepreneur is someone who recognises an opportunity and creates a new venture to pursue it (Bygrave & Hofer, 1991).

Eckhardt and Shane (2003) define entrepreneurial opportunities as “*situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends, or means-ends relationships.*” They exist because different agents have different beliefs about the relative value of resources when they are converted from inputs into outputs (Kirzner, 1979; Shane & Venkataraman, 2000).

In describing the process of entrepreneurial opportunity recognition Ardichvili et al. (2003) delineate three sequential elements: opportunity identification, opportunity development, and opportunity evaluation. Their model outlines that the initiation or identification of an opportunity, may be through either of three distinct processes: perception, discovery or creation (Ardichvili et al., 2003). This is followed by a development phase which is seen as a “*continuous, proactive process essential to the formation of a business.*” The third element in their model, evaluation, is included as a continuous overarching process of interrogation of the opportunity which seeks to identify “*suboptimally deployed resources*” (Ardichvili et al., 2003). This research focuses on the first two steps in the Ardichvili et al. (2003) model – identification and development.

## Opportunity Identification

Opportunity identification has been proposed as a process which begins with an initial vision, or business idea, and develops this into an elaborated vision, or business opportunity (Long & McMullan, 1984). Ardichvili et al. (2003) say that “*opportunities begin as simple concepts that become more elaborate as entrepreneurs develop them.*” Singh (2000) supports a developmental version of opportunity recognition as a linear process, saying “*before business opportunities are recognised, new business ideas must be identified.*” Both Singh (2000) and, Long and McMullan’s (1984) approaches, where the concept of a business idea is different from a business opportunity, are essentially consistent with the one proposed by Ardichvili et al. (2003). Timmons (1994) summation is “*the centre of an opportunity is always an idea, but not all ideas are opportunities.*”

Where a business idea consists of the initial creative cognition (Krueger Jr., 2000), perhaps derived from prior experience (Shane, 2000), or information accessed through social channels (Singh, 2000); the business opportunity, has been in some way assessed to be a potentially viable new venture. In other words, the business opportunity is a screened (Timmons, 1994), evaluated (Ardichvili et al., 2003), or elaborated (Long & McMullan, 1984) business idea, that is both desirable and feasible (Christensen et al., 1994). However, as Singh (2000) points out, at this stage of the process “*opportunity is independent of resources controlled.*” Thus, the concept of a “*business opportunity*” lies somewhere between initial idea identification and the complete development of the opportunity as an emerging entrepreneurial venture.

## Opportunity Development

The next logical step in the process is an increased level of commitment to the development of the business opportunity. This is evidenced by assembling the resources required to exploit the value in the opportunity. In this sense, as the entrepreneur seeks to actualise the business opportunity, they take the decision to “*pursue the opportunity.*” The entrepreneur starts to formalise their opportunity through the creation of a new business venture. The goal is to take advantage of the opportunity (Singh, 2000).

Change and adaptation are accepted as integral components in the entrepreneurial process (Brazeal & Herbert, 1999), and changes to opportunities may facilitated by changing perceptions (Krueger Jr., 2000). It is in this sense that an entrepreneurs social context is important; as they access the information and critical feedback, available through their social network, in order to assess their developing opportunity and adapt it if need be.

## Social Networks

An important way that people gain access to information is through interaction with other people (Shane, 2003). Therefore, one of the ways that people gain access to information about entrepreneurial opportunities is through their social network. Social networks allow access to different human skills and knowledge, which enables the entrepreneur to learn from others experience. Busenitz et al. (2003) points out that entrepreneurs become alert and develop knowledge by making deliberate informational investments (Fiet, 1996) that others do not in order to create a coherent view of opportunity. Thus, the information flows among members of an entrepreneurial network are important to opportunity identification and development. It

is the access to an increased level of information available through a larger social network that has been theorised to be the main benefit (Hills et al., 1997). Empirical evidence supports this theory (Singh, 2000).

De Koning (1999) found that an entrepreneurs information gathering activities were influenced by their social context, particularly through a network which includes “*close and trusted friends*.” Davidsson and Honig (2003) identified that the presence of strong or trusted ties in the social networks of nascent entrepreneurs influenced their level perseverance in pursuit of their venture formation ambition (Hoang & Antoncic, 2003). Of particular interest to this research, and its focus on opportunity recognition, is the fact that a social network governance based in trust, is seen to “*affect the depth and richness of exchange relations, particularly with respect to the exchange of information*” (Hoang & Antoncic, 2003).

### **Interpersonal Trust**

Trust has been called a “*lubricant for co-operation*” (Arrow, 1974), and is considered necessary for understanding interpersonal and group behaviour as well as economic exchange (Hosmer, 1995). Trust constitutes an important source of social capital (Kramer, 1999). Trust may be manifested as a commitment to an exchange before knowing how the other person will behave (Burt, 1999). Lewicki et al. (1998) called trust a “*foundation*” for interpersonal relationships, and for cooperation. Trust seen as a foundation for the exchange of information in interpersonal relationships, would underscore the importance of an investigation of its role in the process opportunity recognition.

Some have assumed that trust, in a general sense, equates to gullibility (Jones, 1996). This interpretation of trust, as a form of gullibility, shows that trust means different things to different people. These differences are born out in the research on trust, which is relatively diverse and multidisciplinary (Dirks & Ferrin, 2001; Lewicki et al., 1998). Rousseau et al. (1998) summarise the interdisciplinary differences, between the economics, psychological, and sociological views of trust. “*Economists tend to view trust as calculative*” (Williamson, 1993); as a rational choice between the risks and benefits of trusting, which is often expressed as the probability of cooperation. The discipline of psychology frames trust in terms of the “*attributes of trustors and trustees and focuses upon a host of internal cognitions that personal attributes yield*” (Rotter, 1967; Rousseau et al., 1998). While sociologists view trust as socially embedded properties of relationships among people (Granovetter, 2000).

Trust has been defined as “*a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another*” (Mayer et al., 1995; Rousseau et al., 1998). As Rousseau et al. (1998) discuss trust, they find common ground between scholars from various fields. According to their definition trust entails three salient properties: a “*willingness to be vulnerable*” (Kramer, 1999) an “*involvement of risk*” (Das & Teng, 1998) and thirdly “*interdependence*” (Mayer et al., 1995; Sheppard & Sherman, 1998). This definition is mirrored by Kramer (1999) who states “*perceived vulnerability or risk*” in relation to “*others on whom they depend*” are the elements of the psychological state of trust.

It is apparent, that when entrepreneurs involve others in the development of their business opportunity, this involves some level of risk. The risk is that the information they share regarding

that opportunity, which forms the essence of their entrepreneurial endeavour, may be used opportunistically by those others with whom they share it. Reynolds (1991) compares this social risk, with the market risk of business creation, and frames it thus: "*it is quite likely that potential entrepreneurs find it more comfortable to take the risks of starting new firms when the major dangers are associated with the marketplace, not the risk that a friend or associate will attempt to take advantage of them at a very vulnerable time.*" On the other hand, Uzzi (1996) suggests that an advantage of trust is that it facilitates fine-grained information transfer. Fine-grained information, would be of particular use in identifying entrepreneurial opportunity. Thus, an entrepreneurs disposition towards trusting others would effect both the identification and development of opportunity.

### **Dispositional Trust**

There is empirical evidence that people have a general predisposition to trust (Gurtman, 1992), and that is it a relatively stable personality characteristic (Kramer, 1999). Rotter (1980) defines dispositional trust as "*a generalised expectancy held by an individual that the word, promise, oral or written statement of another individual or group can be relied upon.*" It is in the case where people do not have experience, or have little experience of each other, or where they meet in ambiguous situations where dispositional trust explains their trusting behaviour most accurately (McKnight et al., 1998; Rotter, 1980).

Entrepreneurial social networks can be dynamic (Greve & Salaff, 2003), and the context in which they are formed and function may be ambiguous (Shane & Venkataraman, 2000). Coupled with the view that entrepreneurial opportunities may have "*brief windows*" (Busenitz et al., 2003). It would be sensible that dispositional trust, be included in any consideration of entrepreneurial networks, and their role in opportunity recognition.

### **Distrust and Dispositional Vigilance**

Recently, organisational researchers consider that it is possible for trust and distrust to co-exist simultaneously (Lewicki et al., 1998; Wicks et al., 1998). Lewicki et al. (1998) found that while "*incentives to collaborate and trust certainly exist, there are simultaneous reasons to distrust relationship partners.*" Wicks et al. (1998) go further to say that a mixture of trust and distrust, is in fact "*optimal*", and that this should be the focus of research. Smilor (1997) states that "*effective entrepreneurs take calculated risks*". Entrepreneurs, it would seem, endeavour to strike an optimal balance between risk and trust, they are not prepared to risk "*everything*" and thus trust completely. It follows, then, that there is need to include distrust in the analysis of trusts role in entrepreneurship.

The conceptualisation of trust and distrust, as a two factor model, has been supported by empirical evidence (Markoczy, 2003), which has shown that trust beliefs are separate and distinct from distrust beliefs, and that trust and distrust cannot be reduced to opposite ends of a continuum (Robinson et al., 1991). It may be the case that distrust has some very real beneficial outcomes, in sense of guarding against opportunism (Elangovan & Shapiro, 1998), as trust by itself does not guarantee trustworthy behaviour (McEvily et al., 2003). Thus, a sense of wariness, vigilance, or distrust (Kramer, 1999), is something that should be accounted for in the same manner as the beneficial outcomes of interpersonal trust.

Kaish and Gilad (1991) found that entrepreneurs paid special attention to risk cues about new opportunities. Thus, an entrepreneurs disposition to vigilance would likely effect their assessment of information relating to business opportunity.

### **Dispositional Trust, Vigilance and Social Networks role in Opportunity Identification**

In examining the effect of trust or vigilance on opportunity identification, the evidence of clearly established relationships between these constructs is ambiguous. Sarasvathy et al.'s (2003a) analysis of the psychological aspects of entrepreneurship, acknowledged that the issue of trust is an “*area of theoretical discontent.*” Their summation calls for a balance between the opposing views of trust and distrust: where people are seen as having undue predispositions to either self-interest, or altruism (Sarasvathy et al., 2003).

Some researchers have characterised entrepreneurs as disposed to distrust (de Vries, 1996). In examining entrepreneurship, de Vries's (1996) empirical research found that a need for control, and a sense of distrust were common themes. Smilor (1997) states that entrepreneurs possess a desire for control, as they seek to determine their own destinies. Given the entrepreneurs predilection towards controlling their destiny, they may be disposed towards higher levels of vigilance, and potentially lower levels of trust (Das & Teng, 1998).

An alternate perspective is that an overarching disposition to distrust is detrimental to entrepreneurship (Granovetter, 2000). With respect to entrepreneurs and their social networks Granovetter (2000) found that “*one of the most powerful and obvious impediments to economic activities is a pervasive mistrust of others.*” Though Granovetter (2000) concedes that trust is often limited in the conduct of business.

What is likely though, is that aspects of both of these viewpoints are true. Gurtman (1992) concluded that dispositional extremes of either distrust or trust are associated with interpersonal difficulties. Therefore, balanced dispositions to trust and vigilance should be of most benefit the exchange of information, and access to opportunities in entrepreneurial social networks. However, these relationships need to be tested. Drawing on these findings, and previous discussions of literature relating to opportunity recognition, and interpersonal trust the following four hypotheses are proposed:

*Hypothesis 1a:* The number of business ideas recognised by an entrepreneur is associated with their disposition to trust.

*Hypothesis 1b:* The number of business ideas recognised by an entrepreneur is associated with their disposition to vigilance.

*Hypothesis 1c:* The number of business opportunities recognised by an entrepreneur is associated with their disposition to trust.

*Hypothesis 1d:* The number of business opportunities recognised by an entrepreneur is associated with their disposition to vigilance.

Hills et al. (1997) found that entrepreneurs who accessed social channels in order to identify business ideas reported significantly more ideas than those entrepreneurs who did so

in isolation. Singh (2000) undertook an in depth empirical study examining the opportunity recognition characteristics of American ICT entrepreneurs, finding that the larger social network an entrepreneur maintained, the more business ideas they would identify (Singh, 2000). Based on informational theories of entrepreneurial opportunity recognition (Kirzner, 1979), and drawing on the findings of Hills et al. (1997) and Singh (2000), the following hypotheses are proposed:

*Hypothesis 2a:* The number of business ideas recognised by an entrepreneur is positively associated with the size of their social network.

*Hypothesis 2b:* The number of business opportunities recognised by an entrepreneur is positively associated with the size of their social network.

### **Dispositional Trust, Vigilance and Social Networks role in Opportunity Development**

Considering dispositional trust, and vigilance in relation to the development of entrepreneurial opportunities, arguments may be drawn that a disposition toward higher trust, in the absence of excess vigilance would encourage the pursuit and development of entrepreneurial opportunity. Lewicki et al. (1998) proposes this; and identified that a combination of high trust and low distrust, and consequently low vigilance, leads to the pursuit of opportunities.

It has also been argued that trust in its broadest sense is simply having confidence in the realisation of your expectations (Luhmann, 1979). In this manner, a disposition toward trust may be linked with the pursuit of opportunity. Such that the entrepreneur in pursuing an opportunity, takes the decision to realise their expectations. However, a disposition to excess vigilance, and wariness, may be seen to inhibit the active pursuit of opportunities.

Similarly, an excessively vigilant disposition may affect the entrepreneurs willingness to take on feedback with which to adapt their opportunity. While a disposition toward trust may result in an openness toward taking on feedback regarding ways to adapt an opportunity. However, these inferences drawn from the literature, must be tested. Thus, in relation to findings from the literatures of opportunity recognition, and interpersonal trust, the following four hypotheses are proposed:

*Hypothesis 3a:* The number of business opportunities pursued by an entrepreneur is positively associated with their disposition to trust.

*Hypothesis 3b:* The number of business opportunities pursued by an entrepreneur is negatively associated with their disposition to vigilance.

*Hypothesis 3c:* The level of change in a business opportunity prior to firm founding is positively associated with an entrepreneurs disposition to trust.

*Hypothesis 3d:* The level of change in a business opportunity prior to firm founding is negatively associated with an entrepreneurs disposition to vigilance.

It is likely to be the case that entrepreneurs with larger social networks access more support, and other resources with which to actively pursue opportunities. Hills et al. (1997) found that network entrepreneurs pursued more opportunities than solo entrepreneurs. The reasoning

here is, with access to more information through their social networks, with which to identify opportunities, the network entrepreneur would have more opportunities from which to choose as being worth pursuing. Singh's (2000) empirical work also found a positive relationship between the size of an entrepreneurs social network and the number of opportunities that they pursued. Drawing on these findings, and previous discussions of opportunity recognition, and social networks the following hypothesis is proposed:

*Hypothesis 4a:* The number of business opportunities pursued by an entrepreneur is positively associated with the size of their social network.

De Koning (1999) found that entrepreneurs used extensive networks to assist the evolution of their business opportunities. Thus, it is also likely that entrepreneurs will adapt their opportunity further as they take on more information, through a larger social network. This follows a similar line of reasoning to the argument above, regarding the pursuit of opportunities. In this sense the entrepreneur accesses feedback from their social network with which to develop their opportunity. The following hypothesis is proposed:

*Hypothesis 4b:* The level of change in a business opportunity prior to firm founding is positively associated with the size of an entrepreneurs social network.

## METHODS

### Research Design

This research was designed as a cross-sectional study. The data for this study were collected using an online self-report questionnaire. For reasons of practicality, an investigation across industries, and an examination of their effects, was reasoned to be beyond the scope of this research. The information and communications technology (ICT) industry in Queensland, Australia was chosen as an appropriate setting for the investigation of entrepreneurial opportunity recognition, as it is predominated by small businesses displaying entrepreneurial attitudes towards growth (Queensland Department of State Development and Innovation, 2003).

### Sample

The sample population for this study was drawn from the Queensland ICT Products and Services Guide (Information Industries Bureau, 2004). The products and services guide, is an online database, which lists the details of over 500 Queensland ICT companies. The chief executive officers of these ICT companies formed the target sample for this study.

Of the 571 directors of Queensland based ICT companies invited to participate in the study, 78 survey responses submitted. Of the 78 completed surveys received 9 were deemed to not meet validation criteria, as the respondents were either were not founders of their business (7 respondents), were franchisees (1 respondent), or were not responsible for the generation of new business ideas (1 respondent). A further 6 responses did not contain complete survey forms. As such 63 valid and complete online survey responses were received from ICT entrepreneurs. Which corresponded to a response rate of 11.0 percent. These 63 responses formed the basis of all analyses.

Ancillary data on the number of firms located within in each of 10 geographic regions across Queensland was cross-tabulated with that from which survey responses were received. A Pearson Chi-Square test indicated that there was no significant non-response bias ( $F = 0.363$ ,  $\chi^2(9, 642) = 6.19$ ,  $p = 0.720$ ), with each region represented in similar proportion between the original sampling frame and the survey responses received.

### Survey Instrument

The design of the questionnaire drew heavily on the work of Singh (2000) who developed an instrument to measure both entrepreneurial opportunity recognition, and social network characteristics. A number of other published sources were adapted and used in the construction of measurement scales. Validity was established by using these pre-existing, validated, measurement scales, where possible, and framing them in the context of this research. The survey also established internal validity, by using a series questions to screen the respondents, as being part of the target sample of “*entrepreneurs*”, from those who were not.

Prior to administering the final survey instrument, it was pre-tested. This pre-testing allowed the assessment of the reliability for the various measurement instruments in the survey questionnaire, particularly the newly adapted trust and vigilance scales. Data from the pre-test survey was used to calculate reliability statistics for all multiple item measures. Survey items which reduced the internal consistency of the scale, were either modified to improve clarity, or removed from the final instrument.

### Dependent Variables

Four variables were conceptualised for the entrepreneurial opportunity identification and development construct (Ardichvili et al., 2003). Two variables measured the opportunity identification construct: the number of business ideas recognised, and the number of business opportunities recognised. Another two variables were used to measure the development of opportunity: the number of opportunities pursued, and the change to an opportunity. All four of these variables were based on measures developed in previous studies of opportunity recognition (Hills, 1995; Singh, 2000).

*Business Ideas, Business Opportunities, Opportunities Pursued:* The three variables which quantified the number of ideas recognised, opportunities recognised, and the opportunities pursued, were measured using three survey items each. These three items asked the respondent to quantify their opportunity recognition over three time periods: the previous month, the past year, and the past 5 years. The responses were originally measured using a 7 element ordinal-scale, which ranged from no opportunities recognised, through to 10 or more opportunities. The responses were coded as 0 for “*no opportunities*”; 1 for “*one opportunity*”; 2 for “*two opportunities*”; 3 for “*three opportunities*”; 4.5 for “*between four and five opportunities*”; 7.5 for “*between six and nine opportunities*”, and 10 for “*ten or more opportunities*”. Composite scales for the business ideas recognised, opportunities recognised, opportunities pursued, were then computed as the arithmetic mean of the 3 survey indicator items measured over the previous month, year and five years. Consequently values for these three opportunity recognition variables ranged from 0 to 10. The Cronbach alpha reliability scores for these measures were: business ideas  $\alpha = 0.86$ ; business opportunities  $\alpha = 0.90$ ; opportunities pursued  $\alpha = 0.85$ .

*Change to Opportunity:* The change to an opportunity was measured using two questions in the survey, which asked “How much did you modify your opportunity?” With the context of the change between first having the idea for the current business and the recognition that this was viable business opportunity. As well as the change between the recognition of the business opportunity and founding the firm to pursue that opportunity. The responses for these two questions were measured using a 5 element Likert-scale, which was coded as, 1 for “no change”; 2 for “slight change”; 3 for “moderate change”; 4 for “major change”; and 5 for “completely changed”. As with other composite measures the arithmetic mean was used to aggregate the coded responses, resulting in a measure which ranged from 1 to 5. The Cronbach alpha reliability score for this measure was  $\alpha = 0.70$ .

### Independent Variables

*Dispositional Trust:* The measurement of the dispositional trust variable used 8 items adapted from scales used in prior studies which measured generalised dispositional trust (Rotter, 1967; Wrightsman, 1964; Yamagishi, 1992), framing them in an entrepreneurship context, where possible. Questions asked “Based on your experience, please respond to the following statements”, and listed a number of statements about trust and responses were measured using a 5 element Likert-scale, from “strongly disagree” to “strongly agree”, which were coded from 1 to 5, respectively. Five items in this adapted instrument were drawn from the Rotters (1967) Interpersonal Trust Scale; one was drawn from Wrightsmans’ (1964) Philosophies of Human Nature Scale; and two were drawn from Yamagishi’s (1992) adaptation of the original trust scale developed by Rotter (1967). These source items were chosen for this research as their validity and reliability had been previously established (Wrightsmans, 1991; Yamagishi et al., 1999). The Cronbach alpha reliability score for this measure was  $\alpha = 0.73$ .

*Dispositional Vigilance:* The measurement of the dispositional vigilance variable used 3 items adapted from scales used in prior studies (Currall & Judge, 1995; Yamagishi, 1992). Two items were drawn from Yamagishi’s (1992) vigilance scale, and the third was adapted from an instrument developed by Currall and Judge (1995).

*Social Network Size:* The size of an entrepreneurs social network, was operationalised as the number of social contacts they had discussed their opportunity with prior to founding their firm. This variable was measured using a 6 element ordinal-scale, which ranged from, from “no social contacts”, through to “11 or more contacts”. Responses in this ordinal scale were and coded as 0 for “no contacts”; 1 for “one contact”; 2 for “two contacts”; 4.5 for “between three and five contacts”; 8 for “between six and ten contacts”; and 11 for “eleven or more contacts”. Therefore, values for this variable ranged from 0 to 11.

### Control Variables

There were six control variables used in the analysis: gender, ethnicity, age, experience, education, and firm age.

*Gender:* The gender of the respondent was used as a dummy variable which was coded as 1 for female or 2 for male. *Ethnicity:* Responses for this measure were transformed into a single dummy variable which indicated the ethnicity of the entrepreneur as “Australian” which was coded

as 0, or “*non-Australian*” which was coded as 1. *Age*: The respondents age was measured using an interval scale. *Experience*: The number of years of ICT industry experience was also measured using an interval scale. *Education*: The respondents educational background was measured using a 6 element Likert-scale, which ranged from “*some high school*” which was coded as 1, through to “*doctoral degree*” which was coded as 6. *Firm Age*: Firm age, or the number of years in which a respondents firm had been operating was measured using a ratio scale.

### Analysis Methods

Hierarchical multivariate linear regression was the main statistical technique used to describe the relationships between dependent and independent variables, and test the proposed hypotheses. Hypotheses were tested by introducing control variables, which could potentially influence the dependent variable, into an initial regression model. Subsequent regression models then added predictor variables (nominally in causal order), and noted the change in model predictive performance. This allowed later models to control for all the independent variables in prior models. Thus isolating, and measuring, the effect of a particular set of predictor variables, and test this influence for statistical significance. The use of the hierarchical regression technique allowed the analysis to focus on the testing of theory.

## RESULTS

### General Results

The ICT entrepreneurs in this study were predominately men (88.1%), who identified themselves as being of Australian ethnic origin (86.6%). The youngest entrepreneur was 20 years old, and the oldest 65 years, the average age was 44.89 years (see Table 1). The vast majority of respondents (88.2%) had some form of education beyond high school, with most attaining a bachelor’s degree (35.3%) or post-graduate qualification (23.5%). The average entrepreneur had almost 10 years ICT industry experience prior to founding their businesses.

The data generally supported a social network view of opportunity recognition with almost all (95.7%) entrepreneurs listing at least one social contact with which they discussed their business opportunity prior to establishing their current firm. The median size of an entrepreneur’s social network was between 3 and 5 people; and the majority (56.5%) had discussed their business opportunity with between three and ten social contacts.

The general disposition towards trust of entrepreneurs in this study could be considered neutral ( $M = 3.12$ ,  $SD = 0.65$ , on a scale from 1 to 5, where 3 is “*neutral*”). This was confirmed by a t-test ( $t = 1.432$ ,  $p = 0.157$ ). Though the entrepreneurs’ disposition toward vigilance was slightly higher, it was still close to neutral ( $M = 3.60$ ,  $SD = 0.72$ ). A paired t-test confirmed the entrepreneurs’ lower level of trust than vigilance ( $t = -3.720$ ,  $p < 0.001$ )

Three composite variables in the opportunity recognition construct measured the number of business ideas an entrepreneur recognised; the number of business opportunities recognised; the number of opportunities pursued. A series of paired t-tests confirmed a process view of opportunity recognition (Ardichvili et al., 2003), with the number of business ideas recognised by entrepreneurs ( $M = 4.39$ ) significantly higher ( $t = 6.776$ ,  $p < 0.001$ ) than the number of business

opportunities they recognised ( $M = 3.58$ ). Likewise, the number of business opportunities recognised was significantly higher ( $t = 5.753, p < 0.001$ ) than the number of opportunities pursued ( $M = 2.53$ ).

Almost all entrepreneurs reported that their business idea (89.7%) or business opportunity (82.1%) changed to some extent, though most commonly they indicated that only a slight change was required. However, when considering the development between business idea and opportunity, the majority of entrepreneurs (55.2%) suggested that there was either a moderate or major change required. These data also suggest that there is a role for social contacts, with over three quarters (76.9%) of entrepreneurs reporting that they had changed their business idea based on discussions with social contacts.

**Table 1: Descriptive Statistics and Correlations**

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1 Gender <sup>†</sup>	1.87	0.34	1.00											
2 Age	44.87	9.53	-0.11	1.00										
3 Ethnicity - Non-Aust <sup>†</sup>	0.13	0.34	0.15	0.06	1.00									
4 Experience	9.89	7.47	-0.27*	0.41**	0.08	1.00								
5 Education	3.76	1.21	-0.12	0.16	-0.08	-0.11	1.00							
6 Years of Firm Opp	2.33	1.32	-0.01	0.57**	0.16	0.27*	-0.12	1.00						
7 Trust Disposition	3.12	0.65	-0.11	0.30*	0.06	0.10	0.20	0.12	1.00					
8 Vigilance Disposition	3.60	0.72	0.02	-0.15	0.15	-0.08	0.21	-0.03	-0.11	1.00				
9 Num Social Contacts	4.08	1.34	0.02	-0.10	0.01	-0.03	0.16	-0.10	0.10	-0.03	1.00			
10 Business Ideas	4.39	1.57	-0.18	0.51**	-0.13	0.37**	0.04	-0.28*	0.46**	-0.04	0.08	1.00		
11 Business Opportunities	3.58	1.56	-0.10	0.40**	-0.15	0.34**	-0.17	-0.10	0.36**	-0.04	0.00	0.82**	1.00	
12 Opportunities Pursued	2.53	1.27	-0.17	-0.23	-0.14	-0.04	0.00	-0.12	-0.10	-0.30*	0.01	0.54**	0.49**	1.00
13 Change to Opportunity	2.54	0.91	0.04	-0.08	0.01	0.02	0.23	-0.14	0.25*	-0.01	0.51**	0.12	0.04	0.06

Note:  $n = 63$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; All significance tests were 2-tailed; <sup>†</sup> Dummy Variable (Gender: 1=Female; 2=Male)

### Dispositional Trust, Vigilance and Social Networks role in Opportunity Identification

*Business Ideas and Interpersonal Trust:* Table 2 summarises the results of the hierarchical regression analysis used to test the set of three hypotheses that proposed associations between the number of business ideas recognised, interpersonal trust, vigilance, and social networks (Hypotheses 1a, 1b, & 2a).

With dispositional trust and vigilance variables included in the regression equation (Model II) a significant relationship resulted ( $R^2 = 0.55, F = 8.425, p < 0.0001$ ) which explained over half of the variance in the number of business ideas recognised by an entrepreneur. This second model significantly explained ( $\Delta R^2 = 0.17, \Delta F = 10.573, p < 0.001$ ) a further 17.4 percent of the variance in business ideas over the initial model which included only the control variables. As indicated by standardised regression coefficients, significant negative relationships were also found between business ideas and dispositional trust ( $\beta = -0.42, t = -4.393, p < 0.0001$ ) and dispositional vigilance ( $\beta = -0.20, t = -1.879, p = 0.066$ ). Although the significance of the dispositional vigilance relationship as marginal. As dispositional trust and vigilance were found to be significant predictors of the number of business ideas recognised, these data provided support for Hypothesis 1a and Hypothesis 1b.

A third model (Model III) which included the number of social contacts as an independent variable, was also significant ( $R^2 = 0.56$ ,  $F = 7.504$ ,  $p < 0.0001$ ), though the additional proportion of variance which it explained was small ( $\Delta R^2 = 0.01$ ,  $\Delta F = 0.615$ ,  $p = 0.436$ ). In this case, with dispositional trust and vigilance taken into account, the number of social contacts was not found to be a significant predictor of business ideas ( $\beta = 0.07$ ,  $t = 0.784$ ,  $p = 0.436$ ). Hence no support was found for Hypothesis 2a.

**Table 2: Results of Hierarchical Regression Analyses for the Identification of Entrepreneurial Opportunities (Business Ideas and Business Opportunities) testing Interpersonal Dispositional Trust, Vigilance and Social Networks**

Independent Variable <sup>‡</sup>	Business Ideas			Business Opportunities		
	Model I	Model II	Model III	Model I	Model II	Model III
<i>Controls</i>						
Gender <sup>§</sup>	-0.307**	-0.338***	-0.339***	∩-0.190	-0.211 <sup>†</sup>	-0.211 <sup>†</sup>
Age	-0.439**	-0.366**	-0.351**	-0.368*	-0.320*	-0.308 <sup>†</sup>
I Ethnicity - Non-Australian <sup>§</sup>	∩0.000	∩0.067	∩0.061	∩-0.123	∩-0.080	∩-0.084
ICT Industry Experience	-0.307*	-0.311**	-0.314**	-0.325*	-0.327*	-0.330*
Education	∩-0.006	∩0.111	∩0.095	∩-0.203	∩-0.127	∩-0.140
Years of Firm Operation	∩0.030	∩0.035	∩0.036	∩0.182	∩0.186	∩0.187
<i>Interpersonal Trust</i>						
II Trust Disposition		-0.417***	-0.423***		-0.271*	-0.276*
Vigilance Disposition		-0.196 <sup>†</sup>	-0.188 <sup>†</sup>		∩-0.127	∩-0.120
<i>Social Networks</i>						
III Number of Social Contacts			∩0.071			∩0.057
R <sup>2</sup>	0.381***	0.555***	0.560***	0.303**	0.375***	0.378**
Adjusted R <sup>2</sup>	∩0.315	∩0.489	∩0.486	∩0.229	∩0.282	∩0.273
ΔR <sup>2</sup>	∩0.381	∩0.174	∩0.005	∩0.303	∩0.072	∩0.003
ΔF	5.745***	10.573***	∩0.615	4.061**	3.101 <sup>†</sup>	∩0.275

Note: n = 63; Standardised  $\beta$  coefficients; <sup>†</sup> p < 0.1; \* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001; <sup>‡</sup> Significance tests on control variables and interpersonal trust variables were two-tailed tests, all others were one-tailed tests; Dependent variables: Business Ideas & Business Opportunities; <sup>§</sup> Dummy Variable

*Business Opportunities and Interpersonal Trust:* Table 2 also summarises the results of the hierarchical regression analysis used to test the three hypotheses, which proposed associations between the number of business opportunities recognised, interpersonal trust, vigilance and social networks (Hypotheses 1c, 1d, & 2b).

The inclusion of dispositional trust and vigilance variables in a model with the 6 control variables (Model II) resulted in a significant regression relationship between the number of business opportunities recognised and these independent variables ( $R^2 = 0.38$ ,  $F = 4.050$ ,  $p = 0.001$ ). This model explained a marginally significant proportion ( $\Delta R^2 = 0.07$ ,  $\Delta F = 3.101$ ,  $p = 0.053$ ) of the variance in the number of business ideas recognised by an entrepreneur. Dispositional trust was found to be a significant predictor of business opportunities ( $\beta = -0.27$ ,  $t = -2.380$ ,  $p = 0.021$ ).

The subsequent model (Model III), failed to reveal any further significant relationships between business opportunities and the number of social contacts. In summary, the results of this analysis supported Hypothesis 1c, but failed to support Hypothesis 1d, or Hypothesis 2b.

### Dispositional Trust, Vigilance and Social Networks role in Opportunity Development

*Opportunities Pursued:* Table 3 summarises the results of the hierarchical regression analysis conducted to test the three hypotheses, which proposed an association between the number of business opportunities pursued; social contacts, interpersonal trust and vigilance (Hypotheses 3a, 3b, & 4a).

As shown in Table 3, when dispositional trust and vigilance variables were added (Model II) a significant regression relationship was found ( $R^2 = 0.25$ ,  $F = 2.188$ ,  $p = 0.043$ ), which explained one quarter of the variance in the number of opportunities pursued. A significant amount of the variance in opportunities pursued (13.5%) was attributed to the addition of these two variables ( $\Delta R^2 = 0.14$ ,  $\Delta F = 4.838$ ,  $p = 0.012$ ), and a significant negative relationship was found with vigilance ( $\beta = -0.44$ ,  $t = -3.109$ ,  $p = 0.001$ ). However the subsequent model which included the number of social contacts in the regression equation (Model III) was confounded by its inclusion.

The results of this analysis suggested that, the lower an entrepreneur's disposition to vigilance was, the more likely they were to pursue an opportunity. Thus, these results suggested support for Hypothesis 3b, but failed to provide evidence which supported Hypothesis 3a or Hypothesis 4a.

**Table 3: Results of Hierarchical Regression Analyses for the Development of Entrepreneurial Opportunities (Opportunities Pursued and Change in Opportunity) testing Interpersonal Dispositional Trust, Vigilance and Social Networks**

Independent Variable <sup>‡</sup>	Opportunities Pursued			Change in Opportunity		
	Model I	Model II	Model III	Model I	Model II	Model III
<i>Controls</i>						
Gender <sup>§</sup>	β-0.202	β-0.205	β-0.205	β0.095	β0.116	β0.112
Age	β-0.250	β-0.351*	β-0.351†	β-0.136	β-0.234	β-0.145
<b>I</b> Ethnicity - Non-Australian <sup>§</sup>	β-0.112	β-0.035	β-0.036	β0.027	β0.016	β-0.016
ICT Industry Experience	β-0.033	β-0.024	β-0.024	β0.160	β0.167	β0.145
Education	β-0.041	β0.089	β0.088	β0.276†	β0.253†	β0.158
Years of Firm Operation	β0.017	β0.072	β0.072	β-0.075	β-0.053	β-0.047
<i>Interpersonal Trust</i>						
<b>II</b> Trust Disposition		β-0.062	β-0.062		β0.267*	β0.233*
Vigilance Disposition		β-0.438**	β-0.437**		β-0.064	β-0.014
<i>Social Networks</i>						
<b>III</b> Number of Social Contacts			β0.003			β0.417***
<b>R<sup>2</sup></b>	β0.109	β0.245*	β0.245†	β0.088	β0.157	β0.325**
<b>Adjusted R<sup>2</sup></b>	β0.014	β0.133	β0.117	β-0.009	β0.032	β0.210
<b>ΔR<sup>2</sup></b>	β0.109	β0.135	β0.000	β0.088	β0.069	β0.168
<b>ΔF</b>	β1.148	β4.838*	β0.001	β0.904	β2.210	β13.164***

Note: n = 63; Standardised β coefficients; † p < 0.1; \* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001; ‡ Significance tests on control variables were two-tailed tests, all others were one-tailed tests; Dependent variables: Opportunities Pursued & Change in Opportunity; § Dummy Variable

*Change in Opportunity:* It was proposed that entrepreneurial opportunities change as they are developed; and the level of change to an opportunity, was associated with the number of social contacts an entrepreneur used (Hypothesis 4b), as well as their disposition to trust and to vigilance (Hypothesis 3c, and Hypothesis 3d). Table 3 summarises the results of the hierarchical regression analysis conducted to test these three hypotheses.

Initial regression models (Model I & II) for the level of change in opportunity (see Table 3) were poorly described, and did not result in a significant relationships. Although trust was found to be a significant predictor of opportunity change ( $\beta = 0.27$ ,  $t = 1.990$ ,  $p = 0.026$ ), the evidence of its influence is weak. A final model which included the number of social contacts (Model III) resulted in a significant relationship ( $R^2 = 0.33$ ,  $F = 2.834$ ,  $p = 0.008$ ), which accounted for over 16 percent of the variance in opportunity change ( $\Delta R^2 = 0.17$ ,  $\Delta F = 13.164$ ,  $p = 0.001$ ). Importantly, the number of social contacts ( $\beta = 0.42$ ,  $t = 3.628$ ,  $p < 0.001$ ) was found to be a statistically significant predictor of the level of change in opportunity.

Overall, these data provided support for the proposition that change in entrepreneurial opportunity is positively associated with the number of social contacts (Hypothesis 4b), though they did not support dispositional trust or vigilance (Hypothesis 3c, and Hypothesis 3d).

## DISCUSSION

### Dispositional Trust, Vigilance and Social Networks role in Opportunity Identification

In respect of the role played by interpersonal trust in the identification of entrepreneurial opportunities, the findings of this study indicated that an entrepreneurs disposition to trust and vigilance were important factors. The evidence in this study suggested that the number of business ideas, and business opportunities recognised by an entrepreneur had an inverse relationship with their disposition to trust others. The lower an entrepreneurs general disposition to trust others, the more business ideas, and opportunities they recognised.

It has been proposed that entrepreneurs may have a general disposition to distrust (de Vries, 1996). However prior research has not sought to establish the importance of this assertion in relation to the processes of entrepreneurship. Moreover, the findings of this study did not suggest that the entrepreneurs disposition towards trust was low. The general disposition towards trust of the entrepreneurs in this research could be considered as essentially neutral. Thus, de Vries (1996) characterisation of entrepreneurs as distrustful is not supported by the findings of this research. What the findings of this research did show, however, was that an entrepreneurs disposition towards trust was an important determinant of the number of business ideas, and business opportunities they recognised. This relationship is not one, to the authors best knowledge, that has been established previously. Thus, this finding may be considered to add to the literature of entrepreneurial opportunity recognition. The findings of this study also suggested that an inverse relationship exists between dispositional vigilance and the number of business ideas an entrepreneur recognised. These two findings for dispositional trust and vigilance, suggest that a balance between trust and vigilance is beneficial to the identification of entrepreneurial opportunities. In some respects this supports Gurtman's (1992) suggestion that extremes of either distrust or trust are detrimental to interpersonal processes.

## **Dispositional Trust, Vigilance and Social Networks role in Opportunity Development**

A finding of this research is that an entrepreneurs disposition to vigilance is a determining factor in the number of opportunities they pursued. The findings suggested that the lower an entrepreneurs disposition to vigilance, the more opportunities they pursued. This may be seen as supporting the inference that a disposition to excess vigilance inhibits the decision to pursue opportunity. In particular, this finding is important in considering the entrepreneurs decision to develop their opportunity beyond being “*a potentially viable business opportunity*” by assembling the resources required to initiate a new venture. This relationship has not, to the best of the authors knowledge, been previously established, and thus adds to the literature on entrepreneurial opportunity recognition.

The findings of this research also identified that the size of an entrepreneurs social network affected the level to which they altered their opportunity. That is to say, the larger an entrepreneurs social network, the more they changed their opportunity as they developed them. This finding supports De Koning’s (1999) assertion that entrepreneurs used extensive networks to assist the evolution of their business opportunities. Also, that entrepreneurs take on feedback from their social network in order to develop their opportunities. A theoretical implication of this finding is that it supports the notion that entrepreneurial opportunity recognition is a function of social information processing (West III, 2003). These findings would also suggest, that practicing entrepreneurs be encouraged to make use of extended social networks to develop their business opportunities.

### **Limitations**

This research has some recognised limitations. One is that the study used a cross-sectional research design, with a sample drawn from an industry specific population. Despite their limitations in drawing causal inferences, cross-sectional studies are common in empirical entrepreneurship research (Chandler & Lyon, 2001). By controlling for industry, the internal validity of this research was increased; however it was recognised that this might have an adverse effect on external validity. While the response rate for this study was low, it is comparable to many other studies in this field. Also, it must be acknowledged that the size of the sample from which the findings are derived is quite small. Therefore the conclusions of this study should be treated with caution, in any attempt to generalise.

## **CONCLUSION**

This research sought to answer the question: What are the roles of social networks and interpersonal trust and vigilance in the entrepreneurial opportunity recognition process? In response to that question, it is the conclusion of this research, that both social networks and interpersonal trust have important roles in the process of opportunity recognition.

An entrepreneurs disposition to both trust and vigilance effected the outcomes of their opportunity recognition behaviours. Should an entrepreneurs disposition be too trusting, they were less likely to identify entrepreneurial opportunities. Similarly, should an entrepreneurs disposition be too vigilant they, were also, less likely to identify entrepreneurial opportunities. Further, this research suggested that an excessively vigilant disposition, inhibits an entrepreneurs pursuit of opportunity. Also, that extended social networks and a trusting disposition facilitate the development of entrepreneurial opportunities.

These findings in relation to trust, have contributed to a greater understanding of the decision making of entrepreneurs in the process of opportunity recognition. However, as Shane and Venkataraman (2000) remind us, entrepreneurial thoughts and behaviours are not stable characteristics that differentiate some people from others across all situations. This serves to highlight that while dispositional trust or vigilance may not necessarily differentiate entrepreneurs from others, they are important factors in the processes of entrepreneurship. This conclusion is novel, and thus, contributes to the literatures of entrepreneurship and opportunity recognition.

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