DEVELOPING QUALITY IN NETWORKS: A QUALITATIVE ANALYSIS OF MALE AND FEMALE ENTREPRENEURS IN SCIENCE, ENGINEERING AND TECHNOLOGY-BASED VENTURES

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ABSTRACT
The ability to develop and manage effective networks is a crucial entrepreneurial competence for small and medium-sized enterprise establishment and growth. Relatively little attention has been paid to networks/networking in female-owned ventures, however, limited evidence suggests that men and women may develop different approaches to network development and participation. The paper reports findings of exploratory, qualitative research conducted in Northern Ireland focused on the nature and dynamics of entrepreneurial networks in science, engineering and technology, sectors viewed as male-dominated. Similarities and differences in female and male network development and quality are explored and their implications are discussed.

INTRODUCTION
The encouragement of enhanced levels of entrepreneurial activity is seen by many government agencies as of vital importance to job creation and economic growth. Some studies suggest that men are three to four times more likely to start new ventures than women (O’Reilly & Hart 2003), thus, levels of female engagement in enterprise creation are significantly lower. In recognising the entrepreneurial potential of women, governments are now seeking to encourage women to enter into self-employment (Bulter 2003). Female entrepreneurs are well-represented in some service sectors of the economy such as retail but are heavily underrepresented in other areas such as science, enterprise and technology (SET), despite increasing numbers of women studying these subjects at university (Mayer 2006).

An entrepreneur establishing a new venture needs to have access to and use of a range of resources. Indeed, utilising resources beyond the control of the entrepreneur and his or her venture is a key feature of entrepreneurial behaviour (Timmons 1999). Hence, networking appears to be a crucial entrepreneurial activity, vital to accessing further resources to develop new and existing businesses. Characteristics of the entrepreneur’s network, and his or her behaviour within that network, have a strong impact on the nature and quality of resources acquired. The resource requirements of some types of firm are more modest than others; SET-based enterprises, particularly those which are product-based, tend to have complex and diverse resource needs (Cooper 2000) so networking is important for both individual firm growth and, more broadly, sector development.

Whilst networks and networking in general have been the focus of extensive study, considerably less attention has focused on the nature and dynamics of female entrepreneurial networking activity. Recent research that has compared male and female entrepreneurs suggests that, with respect to many aspects of firm creation and operation, they adopt similar approaches (Alsos & Lunggren 1998, Buttnner 1993, Davis and Long 1999); however, the little evidence that exists in relation to the determination of quality in networks suggests that clear gender differences may exist (Ibarra 1993, Knouse & Webb 2001). It is essential to develop a greater understanding of what constitutes effective network quality and how it can be developed, in relation to both male and female ventures, given they are deemed crucial for successful business formation and expansion (Carter & Allen 1997, Carter & Anderson 2001, Shaw et al. 2001).
The research reported here sought greater insights into the nature and dynamics of networks and networking by male and female entrepreneurs in established SET-based ventures, in sectors traditionally viewed as male-dominated. Issues identified in the literature related to entrepreneurship, networking and network quality, both generically and specifically in relation to gender, are discussed prior to consideration of the qualitative research methodology adopted for the study. The approach to data collection and analysis is discussed, including how credibility, transferability, dependability and confirmability of the research findings were established, using recognised strategies. The use of NUD.IST facilitated the extraction of core insights, and quickened and enriched the analysis process. Implications of the research findings for the development of entrepreneurial firms are discussed, taking into account both micro-level issues and the wider economic policy agenda.

 NETWORKS, QUALITY AND GENDER ISSUES IN NETWORK DEVELOPMENT

The entrepreneurial process explains the efforts of the entrepreneur to obtain and maintain a fit between a viable market opportunity and the resources needed to exploit it. The entrepreneur is recognised as one who thrives in circumstances of chaos, discontinuities and limited information, but needs contacts as well as knowledge and confidence to be able to mobilise resources necessary to exploit opportunities. Networking is particularly valuable for the entrepreneurial venture allowing its “smallness” to be offset by the support mechanisms provided through the creation and development of strong networks (Johannisson 2000, Szarka 1990). In an environment characterised by financial, knowledge and time constraints (Brown 1985, Davis et al. 1985, McKinnon 1972, Carson 1999) the entrepreneur’s network can provide access to key resources (Bretherton & Chaston 2005, Timmons 1999) which enlarge the span of action of the entrepreneurial decision-maker, allow short cuts to be taken with confidence and time to be saved as a result, and act as an important source of learning (Taylor & Thorpe 2004). Indeed, Johannisson considers that “… the personal network of the entrepreneur should be regarded as his/her major asset” (1986, p. 20).

Firms succeed through accessing opportunities and resources and making available resources in exchange. This is achieved most effectively by building networks of mutually-supportive and cooperative relationships, grounded in trust and commitment (Blois 1996, Gummesson 1987, Jarillo & Ricart 1987, Morgan & Hunt 1994, Shepard 1991). In networking, the entrepreneur reflects dependence on the wider internal and external environment. Notwithstanding the importance of customers in networked relationships of those seeking to grow their ventures, firms increasingly compete “… through developing relatively long-term relationships with such stakeholders as customers, suppliers, employees and competitors” (Hunt 1997, p. 41); thus, networking encompasses all forms of relational exchange, not just those dealing with customers (Morgan & Hunt 1994).

 Network Classification, Evolution, Management and Venture Growth

Those within the network of an entrepreneur tend to be “a collection of individuals who may or may not know each other and who, in some way, contribute something to the entrepreneur either passively, reactively or proactively” (Gilmore & Carson 1999, p. 31). Two types of network can be identified, personal and extended networks. A personal network, centred round the focal entrepreneur, includes all those with whom they have strong and direct ties. It reflects the one-to-one nature of the association rather than a relationship based on close friendships. It is primarily based on direct personal contacts between actors; however, some indirect contacts may be included, and help to build quality into the network (Curran et al. 1991, Dubini & Aldrich 1991, Johannisson 1986). The extended network reflects the total potential of an individual’s personal network of contacts. Employees of the entrepreneurial venture often have their own contacts with others outside the firm and the entrepreneur will want to be able to access such networks through his or her direct relationships with those he or she employs or retains. The entrepreneur needs to strike a judicious balance between direct and indirect ties to maximise his or her span of influence and increase access to information, support and resources (Dubini & Aldrich 1991, Johannisson 1986). The entrepreneur also has to identify meaningful network boundaries, deciding who is to be included, which can be difficult since not all relationships are beneficial; the entrepreneur needs to know the difference and manage each accordingly. The challenge is to “…develop a relationship portfolio or mix that complements existing competencies and enables [the firm] to occupy positions of competitive advantage” (Hunt 1997, p. 440).

Benefits from networking activities are valuable beyond the start-up phase of the enterprise, extending into later phases of development and growth. In understanding the role of networks in new and established ventures it is important to recognise their dynamic nature and evolution through time as relationships as the enterprise grows and develops. Dwyer et al. (1987) identify five phases in the relationship development process; awareness, exploration, expansion, commitment and dissolution. The transformation implicit in the moves between phases describes how relationships between actors
change and develop: actors move towards a better understanding of and need for each other (Tynan 1999). Progress requires giving and taking, negotiation, setbacks and misunderstandings, conflict resolution and steady progress towards a mutually beneficial goal, in which communication is key. Ultimately, trust is the agent that confirms the value of relational exchanges and makes them work.

The entrepreneurial firm is committed to continuous growth and development and as a consequence goes through stages from the pioneering days of early start-up to an enterprise of increasing size and complexity. As the venture develops what it requires from and what it is able to provide to the network will change. Greater understanding of the differences between the stages provides some prospect of managing effectively firm transformation as it develops. As the firm moves from a pioneering stage to become more established, with a recognised market reputation, the nature of networking changes. An initial near dependence on social networks gives way to more business-focused networking and, with increasing success, to more strategic networking. Growing complexities brought about by the firm’s commitment to growth challenge the entrepreneur to adopt an increasingly deliberate and thoughtful approach to networking. Thus, networking emerges as an important competency, crucial to effective decision-making in the entrepreneurial firm (Blois 1996, Butler & Hansen 1991, Hill & Mcgowan 1996).

For relationships to be effective and of value they require the entrepreneur to invest time and effort in guiding, monitoring and managing their development (Burt 1992, Nohria 1992). Indeed, Dubini & Aldrich (1996) identify that a crucial determinant of the entrepreneur’s effectiveness is his or her commitment to a more thoughtful practice of networking activities. Some entrepreneurs, however, are reticent to use networks and are uncomfortable with the idea of using their contacts in any thoughtful, purposeful way. They perceive networking as a vaguely illegitimate practice so their networks are relatively immature and underutilised. Some harbour concerns regarding, for example, possible loss of independence and the costs of networking in terms of time commitment (Curran et al. 1991, Jarillo 1989, Johannisson 1986, Pitt et al. 1991). The need to use network relationships to do business, however, is a persistent one. With successful entrepreneurial effort the pioneering firm is forced along a transformational path towards greater growth with its attendant levels of increasing complexity and need for structure. Increasing complexity points up the continued need to maintain and develop a dynamic network of contacts both within and outside the growing firm (Jarillo 1989).

Network Quality
In managing the development of effective entrepreneurial networks and deciding upon their optimal shape and membership, attention needs to be paid to aspects of network quality if networks are to act as an asset/resource, providing value to the venture. Aspects crucial to developing quality are density, diversity, reachability, centrality and the strength of weak ties (Cromie & Birley 1992, Granovetter 1982).

Density refers to the degree of interconnectedness between network members (Carson et al. 2000), and describes the number of contacts between members, the extent to which they are known, and the ease with which members can access one another for help; the greater the extent of “connectedness”, the more extensive the scope and amount of information/resource obtainable (Jessen & Greve 2002). Developing a network with relatively high density is crucial for the entrepreneur to achieve growth and development (Carsrud et al. 1987) as dense networks mean that information can more rapidly be transferred and processed, facilitating capitalisation of opportunities. Too dense a network, however, will suffer from limited opportunities and a lack of “new thinking” or questioning of current practices.

Diversity is defined in terms of the variety of sources available to the entrepreneur, as well as the background of individual network members, their experience and knowledge (McGowan 2000). Entrepreneurs need to maintain diverse and heterogeneous networks (Birley et al. 1989) to gain information to address opportunities and achieve success (Aldrich et al. 1997). Failure to develop a diverse network means potential gains from such information will be restricted as its “shelf life” is limited (Birley et al. 1991, Burt 1992). Also, diversity influences not only the amount but also the quality of information obtained from network members (Carson & Cromie 1991).

Reachability describes the existence of “pathways” between people who are not directly related to the entrepreneur through the formation of direct ties (Aldrich & Zimmer 1986, Cromie et al. 1994, McGowan 2000) and is based on the ease with which people can “reach” or make contact with one another. Reachability can be described as direct or indirect, however, the higher the level of reachability the greater the contact between indirectly tied members. This presents a role for bankers, accountants, lawyers and enterprise agency staff who can assist and facilitate the entrepreneur in extending the reachability of his or her network beyond its current boundaries (Cromie et al. 1994).
Increased reachability and connectedness will facilitate increased and more rapid access to varied source (Aldrich & Zimmer 1986).

Centrality relates to the number of actors to whom the entrepreneur is connected and the number of steps or physical distance between the focal entrepreneur and individual diverse actors. It sums up the sheer number of contacts to whom the entrepreneur has access within the entire network (Bryson et al. 1993, Granovetter 1973, Johannisson 1986). A high level of centrality mean the entrepreneur is involved in activities in a central network position, as a consequence of which he or she can access a vast range of sources for knowledge, information and advice.

Individuals and organisations within networks are connected via direct and indirect ties, and it is via such connections that relationships develop and mature. Relationships may be strong or weak (Granovetter 1982), measured by frequency and regularity of contact and by the degree of relationship or friendship (Krackhardt 1992). Employees of the firm also have their own contacts which can be valuable for the entrepreneurial venture. Such contacts will not have the regularity of strong tie relationships, but act as a fundamental contact to gain certain information if and when the need arises. This is the strength of weak ties and it is fundamental to the development of network quality. Weak ties permit access to information beyond the scope of their social involvement (Granovetter 1982). The entrepreneur’s challenge is to strike a balance between direct and indirect ties to maximise his or her ability to leverage benefits from diverse sources; the greater the span, the richer the potential for networks to provide information, support and resources (Dubini & Aldrich 1991, Johannisson 1986).

The presence of these dimensions of quality within a network will be reflective of the information and advice which can be gained from the members, and the speed with which it can be obtained.

**Gender Dimensions in Entrepreneurial Networks and Network Quality**

Like their male counterparts, female entrepreneurs seeking to grow their firms or to establish new ventures need to be effective networkers (Brush 1997). Evidence suggests, however, that female networks suffer problems of size, density, diversity and tie strength (Ibarra 1993) which impact directly upon network quality, and consequently the potential for enterprise development and growth. Knouse and Webb (2001) suggest that women’s networks are typically smaller than those of men, and are less dense in nature. In terms of who women network with, many female entrepreneurs have collaborative external relationships and do not identify with existing business associations, clubs or networks (Martin 2001); instead, they have limited, and often all-female, networks which tend to have strong ties. It is suggested that women are still developing their networks as they are relatively new to business ownership, partly explaining limitations of size and density (Davis & Long 1999).

Interestingly, Cromie and Birley (1992) note in the Northern Irish context that female networks do not appear to be less dense or less diverse when compared with those of male entrepreneurs. While, initially, female entrepreneurs may be at more of a disadvantage than their male counterparts, they tend to make a sustained effort to form well-established networks in the early years.

Elements may be identified in male networks, such as the “old boy’s network” developed from “school ties”, “fraternity contacts” and “social organizations” (Knouse & Webb 2001), which impact upon how business is conducted (Gamba & Kleiner 2001) and are missing for the female entrepreneur. Fagenson (1993) suggests that it is vital for women to penetrate these male bastions, from which they are largely excluded (Fagenson 1993, Linehan 2001), if they wish to operate on a par; however, gaining access to such networks poses a real challenge (Aldrich 1989, Shaw et al. 2001). It is suggested that women have not entered into formal male networks because they feel regarded as less competent by male members (Smeltzer & Fann 1989) and are disadvantaged in networking due to their family commitments, previous work experience and a desire to formalise networking activities in a deliberate strategy, mainly including other females (Aldrich et al. 1997, Carter et al. 2001, Martin 2001, Nelson 1989, Smeltzer & Fann 1989, Starr and Yudkin 1996). Consequently, these barriers can limit the diversity and reachability of female networks. Omar and Tan-Wong (1997) point to a shortage of support networks for female entrepreneurs, similar to male "old boy networks"; however, other research suggests formal, all-female networks, could provide the same support for women, as men receive in informal ones (Smeltzer & Fann 1989). Contrasting approaches may be explained by the different priorities which men and women have in establishing networks; women tend to seek social relationships, whilst men seek personal advantages (Buttnner 1993). Differences are also apparent in the role played by networks in venture development (Aldrich 1989, Olm et al. 1988) and the ways in which women determine quality in their networks (Ibarra 1993, Knouse & Webb 2001). Inevitably, this can leave female entrepreneurs at a disadvantage when it comes to gaining knowledge and other resources, which could impact negatively on venture development.
Despite these diverse strands of evidence there is still a lack of understanding regarding quality in entrepreneurial networks and of differences which might exist in male- and female-led ventures, particularly in male-dominated sectors of the economy such as SET. Thus, in this paper the authors seek to compare the networking activities of male and female entrepreneurs and reflect on some of the dynamics of how they manage and develop quality networks in developing their ventures. Prior to presentation of the research findings discussion considers briefly the context of SET-based entrepreneurship and the importance of networking for venture development and growth.

Technology-based Enterprise and Networks

Within the broader policy agenda of many developed and developing nations promoting entrepreneurial venturing, technology-based enterprise is viewed as offering tremendous potential to fuel economic growth (Cooper 2000); consequently, development agencies are keen to identify how they might better encourage and support the establishment and growth of such firms. Studies suggest that, on average, men are three to four times more likely to start ventures than women (O’Reilly & Hart 2003), so levels of female engagement in enterprise creation are significantly lower than those of men. Female entrepreneurs are well-represented in areas such as services and retailing but are heavily underrepresented in others such as SET. Despite increased numbers of females studying SET subjects at university (Mayer 2006) they are still outnumbered significantly by men (Kerr & Robinson Karpius 2004). Further, many female SET graduates do not pursue careers in SET-fields so miss out on the career path and entrepreneurial opportunities which arise from working within these fields (Anna et al. 1999, www.set4women.gov.uk/set4women/statistics/index.htm). Thus, it is not surprising that numbers embarking on entrepreneurial career paths within SET are still heavily skewed towards men.

Government bodies are now seeking to encourage more women to enter into self-employment (Bulter 2003) representing as they do, within some areas of the economy such as SET, a source of relatively untapped entrepreneurial potential. Despite the steady increase in levels of female entrepreneurial activity, a limited amount of knowledge and understanding exists with regard to female ventures (Baker et al. 1997, Carter et al. 2001, Henry & Kennedy 2003, Starr & Yudkin 1996) as much of the early entrepreneurship research linked entrepreneurship with “male” activities (Beaver 2002, Berg 1997, Brush 1992, Carter 2000a, 2000b), perhaps as a result of a lack of sensitivity to aspects of business which might be unique or particularly pertinent to female entrepreneurs (Boden & Nucci 2000, Brush 1992, Da Cunha & De Cunha 2002, Mattis 2004, Ruminska-Zimny 2002).

Networks and networking are of great importance to the development of technology-based ventures as firms rarely function in isolation; most have complex and diverse resource requirements which are met through interacting with a wide range of individuals and organisations from which tangible and intangible resource are acquired (Collinson & Gregson 2003, Cooper 2000, Oakey 1995). Technology firms often acquire specialist inputs from a range of disparate providers and outsource to organisations, both near and far. In terms of finance, while many entrepreneurs rely on internal sources at start-up, externally-sourced funds may be required for subsequent venture growth. Judicious development and use of networks can provide the entrepreneur with access to individuals and organisations capable of either providing the resources themselves, or acting as a gateway, giving access to those who can. The nature of the SET and finance communities means that women who establish SET-based ventures find themselves in a heavily male-dominated environment where most of those with whom they network are men. As was identified earlier, some evidence suggests that men and women may develop and manage their networks in different ways. If networking is vital to the acquisition of resources and men and women network in different ways, it raises questions regarding the impact of any such difference on venture development and growth. Therefore, the empirical section of this paper presents results of research amongst male and female SET entrepreneurs which explores how each builds and develops networks to address their personal needs and those of their venture.

RESEARCH METHODOLOGY & DESIGN

Research approach: Research in the field of entrepreneurship has long been recognised as one that lends itself more appropriately to approaches which allow for discovery and exploration and for theory building. Indeed, many researching in this area have suggested that such a context demands a whole new way of conducting research, beyond the conventional approaches (Chell & Haworth 1992, Carson & Coviello 1995, Hofer & Bygrave 1992). Therefore, a qualitative methodology was considered appropriate for this research project, given the infancy of the research topic and the exploratory nature of the subject itself (Carson et al. 2001, Hill et al. 1999, Hirschman 1986, Miles & Huberman 1994). The empirical study required the undertaking of unstructured, in-depth interviews. An emphasis was placed on the “informal”, with the discussion being exploratory in nature, rather than asking a series of specific, leading questions. Prior to data collection, a series of themes was developed to guide the
interviewer that focused on key decision-making aspects concerned with product, value, delivery and communication as well as information management, relationship building and maintaining competitive advantage. The informality of the approach allowed for an exploration of wider issues relating to the utilisation of networked relationships by both male and female entrepreneurs, to make decisions and to do business. Indeed, the very informality of the interview approach, allowed the participants to discuss their individual experiences in such a way as to allow the issue of their networking activity to emerge. An advantage of this approach was to allow respondents to speak in their own words (Carson et al. 2001, O’Donnell & Cummins 1999) and, thus, to provide crucial insights into the world in which they were active (McGowan 2000). Probing respondents to elaborate on their experiences happened during the interview process only in order to develop the discussion, if appropriate, and to maintain a focus on the interview themes.

Sample: Twenty-one respondents, nine females and twelve males, contributed to the research. All were the owner-managers of established businesses, operating for at least five years. An initial, though perhaps unsurprising observation (given the relative recency of females in entrepreneurial venturing), is that the data set reveals that those businesses under the management of males were much more mature (average of 20 years in business) than those managed by females (average of 12 years in business). All of the businesses involved were located in Northern Ireland and were operating within SET sectors which, traditionally, have been dominated by males. Those participating in the research constituted a purposive sample, designed to provide information-rich case studies, considered as being particularly informative with respect to the phenomenon under research (Neuman 1997).

Data gathering: In-depth interviews were conducted with participants in a two-stage process over a twelve-month period. Each participant in the research was interviewed for an average period of one and a half hours, during each phase. All interviews were digitally recorded and transcribed. The first stage of the research sought to gain insights into how respondents made decisions with respect to key management activities, how they reconciled tensions between competing agendas and how they validated the decisions they made. Following analysis, primary data from the first stage of interviews were brought to those in stage two. At this stage the researchers sought to examine in greater depth the significance of networked relationships in the decision-making processes of respondents. An important focus at this stage was on gaining an understanding of the network ties and network quality.

Data analysis: The analysis of qualitative data is by its very nature chaotic and messy. What is required is an approach to the analysis that is methodical and systematic (Easterby-Smith et al. 1991, Miles & Huberman 1994, Tesch 1990). Often the sheer amount of data obtained is considered a downside of in-depth interview research (Denscombe 2003). Merriam (1988) suggests that qualitative data should be collected and analysed concurrently and, accordingly, this research study adopted such an approach. Interviews were conducted in a series of four sets, consisting of, on average, five companies in each set. Once the first set of interviews was completed, the digitally recorded interviews were then transcribed verbatim. The appropriateness of using digitally recorded interviews eased the transcription process, compared to analogue recordings (Gibson et al. 2005). Each set of interviews was then analysed before the next set of five interviews commenced. Due to the substantial amount of actionable data generated by the in-depth interviews a means was sought that would assist the research team in imposing a systematic rigour and structure on its subsequent analysis. It was recognised, however, that the application of computer technology in analysing large amounts of textual data was no guarantee of quality. Ultimately, computer technology was a tool in the hand of the researchers that would serve to make life easier. However, the old adage “rubbish in, rubbish out” still held true. The researchers were not absolved from the need to take personal responsibility for the management of the data and, ultimately the distillation of research issues from it. It was recognised that the adoption of computer technology would contribute in making that undertaking more efficient. NUD.IST, in particular, was seen to be a versatile software package, which provided the research team with an appropriately extensive range of facilities for the analysis and manipulation of textual data (Catterall & MacLaran 1996, Dey 1993, Richards & Richards 1994).

Determining the value of the research: In order to generate confidence in the outcomes of the research, a number of strategies were employed in the research design. Triangulation, in order to establish the credibility of the data gathering process, was achieved in a number of ways. First, by sourcing data from twenty-one separate cases, in two separate data gathering exercises, over a period of twelve months. Secondly, by feeding back to participants involved in the research their own views and comments expressed in the first in-depth interview, and the researchers’ interpretation of them, the research team sought from the interviewees, clarification, amplification, corroboration and even amendments to those views and comments and the interpretations of the research team (Guba & Lincoln 1994, Hirschman 1986). The role of the research team in the research was made explicit and the potential for personal values, biases and judgements to have an impact on the conduct of the
research was acknowledged. Also stated, explicitly, was the researchers’ past history and close
association with those interviewees involved in the research (Hirschman 1986). The research team
remained vigilant for the emergence of outliers or “exceptions to the rule” in terms of issues arising
from the research in that such exceptions may test the emergence of meaningful theories or point up
the inapplicability of the general data to individual cases (Miles & Huberman 1994, Schofield 1993,
Tesch 1990). The value of the research was also enhanced by the provision of a rich, thick and detailed
description of the research process, the hope being that anyone then interested in the transferability of
the research would be able, within reason, to act upon it (Creswell 1994, Griggs 1987, Kirk & Miller
1986, Merriam 1988, Sykes 1990). Finally, in order to confirm the value of the research design,
including strategies for data collection and analysis, these were reported in detail, and clear insights
were provided as to the methods used in the research study to others outside the research and within
the research team. Each phase in the research study was subject to the critical scrutiny of external
auditors, who were knowledgeable about the value of qualitative research methodologies and
experienced in their use, including the double-blind refereeing processes of international academic

RESEARCH FINDINGS
Aspects of Quality in Male and Female Entrepreneurial Networks
This research provides insights into issues of quality in both male and female entrepreneurial networks.
Findings of this study highlight networking as being of key importance to how entrepreneurs, both
male and female, operate in business, and while they suggest ways in which both utilise networks in
very similar ways they also suggest some subtle ways in which each approaches their efforts to manage
their network of relationships differently. Results suggest that a number of different types of network
exist and are utilised, ranging from personal to formal networks. Extant research, reported earlier,
recognises that the issues of density, diversity, reachability and centrality are key measures of quality
in any individual’s network of relationships, with issues of the strength of weak ties having a bearing
on each. Using these issues as an appropriate basis to do so, the authors report on the results of
research involving both male and female entrepreneurial new venturers who recognise the significance
of their network of contacts to do business.

Diversity
The male and female entrepreneurs engaged in this research recognised, in much the same way, the
importance of managing greater diversity within their respective network, had become increasingly
sophisticated in doing it and appreciated the inherent dangers of failing to do so. They had been
building up their networks over a longer period of time and as a result had expanded, not only, the
number of network contacts but also enhanced the diversity of their networks by involving people with
a wide variety of skills and experiences. Findings highlighted the significant level of industrial
experience that both the male and female entrepreneurs had prior to assuming responsibility for their
businesses. As a consequence they each could talk of a cohort of important contacts that they had
already, prior to becoming owner-managers, contacts that they maintained and nurtured over an
increasing number of years in business. These contacts introduced high levels of diversity into their
network of contacts, for both males and females in relatively similar ways, by introducing a wider
range of experiences, skills and knowledge. External membership of such diverse networks included
close friends, past work or business colleagues, family members including a spouse, customers,
suppliers and professional contacts. Internal members often included employees and, if the business
was developed enough, members of a management board.

A good example of this effort to source information and ideas from a diverse source from
amongst the females in the research was HH(f), an entrepreneurial venturer with considerable business
experience, who discussing the variety of people in her network of contacts stated: “When I first
moved from X [previous employer] and set-up on my own, I really missed the network of people that I
had around me there ... it was the fact that if I had a problem there was always somebody’s door I
could go to and knock on for a bit of advice. But because I left on good terms, I could contact any of
those people I worked with or any of the people I met when I worked there for help. That offered me a
number of different people with different backgrounds and expertise.” RWP(m) in a similar vein, in
searching for guidance on decisions he was making to grow the firm, sought help from a close friend and
business associate. He stated, “I talked to him, because I needed to know how I might, from a business
point of view, ... how I might tackle the thorny situation of my co-owner’s disenchantment with new
company structures, ... as friends we go way back, but I [have] ... a lot of respect for him as an individual
and as a business man, I just had a lot of confidence in his ability and, given the sensitivity of the situation, his ability not to open his mouth to anyone.”

The research highlighted the considerable level of effort required to build that level of diversity into their networks and the conscious, indeed, deliberate need on the part of the male and female entrepreneurs to do so. For example, KM(f) commented, “I appreciate the need to develop more contacts in this field … it is a pain some weeks to have to get organised and travel somewhere for a conference just to meet people and promote what we do but I know that it’s good to get in touch with people who have a vast amount of experience in this industry. After all they could be someone that I might need to get information from on a market or a product … even though I have been doing this for a good while doesn’t mean I know everything.”

Reflecting the added effort needed to protect friendships while building diversity into networks one of the male participants in the research, TMCM(m), expressed views that seemed to suggest the need for a clear distinction between personal friends and those who might be considered business friends or colleagues. He stated, for example, that, “The only people I would speak to about the business and my early thoughts about how it should grow would be colleagues on business development courses that I’ve attended over the past few years.” Reflecting similar sentiments PMCG(m), in describing these special relationships, concluded that, “when we meet, we talk the same language, we’re on the same wave length, we do each other business favours, like passing on information, … you’re not screwing each other to the wall, when you’re actually doing some kind of deal, there’s a high degree of trust, you rely heavily on each other, but at the end of the day you go home to your own friends.”

Density
The density of any entrepreneur’s network refers to the degree to which network members are interconnected with each other. What emerged from this research was that both the male and the female entrepreneurs had developed deep, meaningful relationships with the membership of their respective network of contacts. Indeed, both groups had clearly been creating and maintaining their networks over a long period of time. This involved regular contact amongst network members and having a reputation for being dependable and for doing a good job. As a consequence both the male and female entrepreneurs in the research could, with some confidence, rely on those within their network to represent their interests, even in their absence.

The following comment from AA(f), which summarised the process of developing deep, influential relationships with members of her network, was typical: “I may have met X [network member] eventually through the network, but it just so happened to be that someone in the network that we both knew, brought us together. X [now a network broker] knew that Y [network member] had a need and knew that I could service that need. So I suppose that is the advantage of the network, that even if you don’t know someone, then someone who knows you both can see how you can assist each other and introduces you.” AB, a male participant in the research, reflected similar ideas, insisting that doing a good job, having a reputation for doing quality work was crucial in subsequently gaining access to further business opportunities, because others could then, with confidence recommend him to others: “If you can guarantee that you can do a job well, and you do, you’ll get more. Then the challenge is to build on that, and all the time you’re saying, “who’s doing the job next door?” or “who in the next department buys this type of equipment?” Once you get to know the guys and they know you, and you’re doing a good job for them, they start feeding you information, … things start to spread from then.”

Both male and female entrepreneurs in this research appeared to value the development of networks broadly within their respective industry sector and in this way to increase deliberately the density of their networks. Here again the evidence suggested that there was, increasingly, a degree of sophistication as well as, indeed, a similarity in the way both males and females worked to develop and utilise the degree of density in their network of contact. What appeared from the research was that both male and female entrepreneurs recognised that all relationships, no matter what their origins, had the potential to pay dividends at some time in the future. Their approach to managing all relationships, therefore, reflected the thinking that one never quite knew when someone might prove useful in the future. As AB(m), talking about the young apprentices who worked under him in his early days with a particular company as their maintenance manager, stated, “I treated them all with respect, they were wee fellas looking to learn, … I was happy to help them because when they could do a job right it made my job easier, … others treated them badly, … but I didn’t, … people move on, … you never know where you’ll meet again, … it’s a small world here.” AF(m) too, speaking of people in his network of relationships who were now directors of medium-sized firms and who he had known as they were only launching their management careers, suggested that, “every contact has its potential, … I’m always thinking to the future and where it might lead.”
Other typical comments were offered by CK(f) and DR(f), two female entrepreneurs in the research. CK(f) reflected on how the character of her network of relationships was constantly changing as knowledge of her in the industry grew: “I am becoming more known in this industry now ... I’m meeting new people all the time ... where I might not have all the knowledge on something I can now find out somebody who does and can help me.” DR(f) reflected on how she now had much more of a choice about who to contact, such was the number of people that she now knew in the industry: “I would be able to just lift the phone, if I had a problem, and ask a number of people now...but that is now because I have been working at this for sometime ... I guess, I now have a choice, which I wouldn’t necessarily have had at the beginning. Back then, all this was new to me, so I would have been more reluctant to ask in case people were talking badly about me or the business and would have relied on a few contacts like friends who were in business.” Similarly, WB(m), speaking of his experiences as an employee of one of the largest consulting engineering firms in the market prior to leaving and joining his father’s firm, reflecting on how he had built a reputation with key decision makers in his industry, spoke of how, “all the people at my level when I left, several years ago, are now at either associate or partner levels in that firm, ... and I have a direct line to those very senior people.”

Reachability
An important requirement of those introduced into an interviewee’s network was the potential to access others otherwise beyond the interviewee’s influence. This issue of contact extension or reachability is recognised as a crucial way by which any individual decision maker might add value and richness to their decision making activity, based on the principle of the “strength of weak ties” discussed in the literature review. Certainly the interviewees in the research recognised the value of contact extension opportunities for introducing a greater richness to their portfolio of contacts, in particular in terms of identifying new business opportunities, for growing their respective firm’s potential. As AB(m), a male participant, put it in a comment which very much reflected the ideas of other male and female interviewees, “And they of course will ask them ‘who is this guy?’ and they’d say, ‘he’s so and so’ and that ‘he has done this and he has done that.’ So you’d use them as well to get into somebody else, ... yeh, that’s the method, you use your contacts and through them make other contacts.” TMCM(m) spoke of contacts being an “in” into a market; when discussing the people who get him assigned to a contract, he commented that, “they keep me informed ... they give me information that I would otherwise not have to allow me to make decisions.”

Through contact extensions then the interviewees appeared to be able to gain access to others beyond what might be described as their core network of direct ties. It appeared from the research that the utilisation of these contact extensions was, for the most part, focused on accessing new business opportunities or on identifying entrepreneurial resources. Interviewees also sought validation of the decision that they made to exploit an opportunity or commit scarce resources. The issue of the “informal” in this networking activity emerged as an important factor in determining the effectiveness of this effort to reach beyond an entrepreneur’s network of contacts. RWP(m)’s comment captured the sentiment of the male interviewees on such extended contacts, “... they’re my main source of business, indeed they are the business, ... I just couldn’t operate without them, ... and your contacts make contacts make contacts, ... that’s how it goes, word of mouth, a good reputation, ... no business could survive without them.”

The following comment from KM(f) typifies the inputs of others involved in the research, and illustrates the use of networked contacts who are closest to the focal female entrepreneurs and those further removed from her but accessible to her through established relations: “I am a good one for maintaining networks and I maintain a wide range of links of people – not like my inner circle, where you have your base group. That is one of the things I learned from X [university mentor] about having your network and then your further-out people. He would be one of my further-out networks now. I knew someone who was interested in doing an MSc in marketing and I phoned X to ask him what she should do. He was able to give me advice so I passed it on.” AF(m), too, sought to develop a specific joint venture opportunity with an American firm through developing a relationship to which he was introduced by a core member of his close network of contacts. He stated, “A close business associate of mine approached this guy in the company on our behalf and told him what a wonderful bunch of people we were, we met him ourselves then at an exhibition in Koln and we got on like a house on fire, it turned out his people were originally from Fermanagh, ... we invited him over to see our place, ...and it’s just snowballed from there.”

More formal networks, however, provided a different type of opportunity to reach beyond the individual’s network of direct contacts. Network brokers within the more formal networks provided specialist professional guidance in all sorts of circumstances; in establishing potential joint venture opportunities between their clients or in providing access to essential resources. Such networks might include, for example, venture capitalists, business angels, accountants or bank personnel, and not just with a view to accessing possible financial resources but to gaining access to the extensive experience
and access to wider networks that these people had. A typical illustration of this is reflected in the comment by CK(f), one of the female entrepreneurs: “I’m sure there is a lot that can be gained by introducing help from venture capitalists. They would have a lot of experience and contacts in the industry that we could benefit from.” In a similar vein, RWP(m), stated about a potential joint venture opportunity, “Well that idea actually came to us through our accountants, funny enough, this guy, from Canada, was talking to them about his wish to invest in Northern Ireland. Well our accountants obviously thought ... hey Robert and Jim here, they’re pretty clued in with regards to this in NSLtd.”

Centrality
This research suggested the female entrepreneurs played a focal or central role within their networks, and that their network of direct contacts, and through them indirect contacts, offered significant benefits which they could use to their advantage. Reflected in this idea is the recognition by both male and female participants, that they were at the core of their own network and that, ultimately, it was a resource for them to utilise to their advantage. Members were introduced and utilised and then not, depending on the needs of the focal entrepreneur. They also acted as brokers themselves, putting members of their own network in contact with each other or sharing information and advice with them where appropriate. This comment by KM(f), one of the female entrepreneurs, indicated the nature of centrality for her as an entrepreneurial venturer: “I am also a good resource investigator. So if someone asked me about something I generally know someone who would know, or put them in touch with somebody who could help. ‘Cause I’ve people phoning up and saying do you know where I can get such and such and I’ll, if I don’t know, I’ll know somebody who will through the network.”

The degree of empathy that exists between the actors in the relationship also emerges as significant. The fact that those with whom the interviewees were relating had an appreciation, from actual experience, of the characteristics of the challenges facing the interviewee, emerged as important. Membership was made up, it seemed, of people “in the know”, as mentioned above, who were influential in obtaining a way through to the opportunities or advice from which the interviewees could reasonably expect to prosper. A fundamental criterion for membership, in addition to actors in a relationship treating each other decently and with respect, was the need for mutual trust and confidence in the opinions and ideas expressed by those in the interviewees’ network of relationships. As MLK(m), a male participant, put it when describing one member of his network, “He’s one of the top consultants in that company up in the region.”

The need for quality information and validation available from the networks of relationships managed by the male and female research participants emerged as key determinants of who was included in or excluded from those networks. As TL(m) put it, “Information is power and gathering information and getting it early, while it’s still fresh, is very important if the right decisions are to be made.”

Strength of Network Ties
The final aspect of networking quality to be discussed is the strength of the network ties. This is an issue which has emerged in this research as findings clearly indicate the importance, for both the male and female participants in the research, of having both strong and weak ties in order to develop quality within their networks. Both types of network ties it seemed were used, with some thought, to identify new opportunities, to gain information, advice and access to scarce resources. More crucially, the focal entrepreneurs enjoyed the benefit of being “recommended” by their direct contact to others beyond his or her network of direct contacts. Members of both groups could trade on their high standing and on that of their network referees in order to make progress with a new contact. A typical comment by AA(f) illustrates this issue: “I met X [member of her network] when I returned here to Northern Ireland. He has vast experience in business ... He has been a great help to the company, helping me out ... X will open a door that I will never open, cause he has forty years of contacts and more than our sales people will ever open. You know, it’s a major thing to get people like that to help you ... I can obviously get linked to people through him, some of them I could never have developed on my own.” Similarly, WB(m) too reflected on how influential members of his industry network could open doors for him, stating, “I’m on the phone to them three and four times a month, getting the low-down on schemes that are coming up in which my firm would have an interest, getting a bit of advice, and just keeping your ear to the ground with them, ... after all their one of the biggest companies of their kind in these parts.”

By expanding their weak ties the male and female entrepreneurs in the research sought to develop further issues of quality in their networking activities. This sentiment was captured by LP(f) and reflected how the nature of her networking had developed over the lifetime of her business career: “I wouldn’t have done this is the early days but by going to industry conferences I have gotten to know a few people involved with the big players in the market. This has helped us to develop a relationship with one company who we are thinking of going in alongside with on a project. We are hoping that that will allow us to get to know other companies they deal with.”
CONCLUSIONS

A consensus view to emerge from the data gathered amongst the male participants in the research suggested that the primary purpose of networked relationships was to identify new or additional business opportunities and access to entrepreneurial resources, and to determine how best to exploit them. “Business opportunities” ranged from obtaining further sales from either existing or potential customers for the firms’ current product offerings, to more complex strategic proposals to exploit some new market, product or technological opportunity.

An outcome from this research suggests that, in pursuit of these ends, both the male and female entrepreneurs appeared to have arrived at a high level of sophistication in the way they developed and managed their network of contacts. For both, the maturity and frequency of use of the relationships within the network, which had been built over a long period of time with the “correct” individuals, enhanced the potential of those contacts. Key external contacts appeared to be with buyers, suppliers and customers, while, within the firm the interviewees appeared to have identified specific individuals to whom they turned for help, members, often, of their management teams. Both types of networked relationships provided the focal individual with the scope to access others beyond the network of direct relationships, with specific technical expertise and experience otherwise unavailable to the decision maker within their existing network. What appeared to be the case was that, in very similar ways, both male and female entrepreneurs were able to reach outside their existing network boundary and, thus, extend their span of control and influence, to identify new opportunities and to gain access to entrepreneurial resources. In this way the potential, inherent in the “strength of weak ties” as identified by Granovetter (1982), was apparent, as the focal entrepreneurs moved beyond the scope of his or her existing network of contacts to engage others with whom they had no prior association or with whom they had “weak” ties. The strength of these “weak” ties was found to lie with their potential to provide access, without prejudice, to new opportunities and potential resources as well as informed attitudes and perspectives on the plans of the focal entrepreneur.

Both the male and the female entrepreneurs engaged in the research appeared to appreciate, in much the same way, the need to increase their network of contacts and to do this in a more thoughtful and increasingly sophisticated way. They increasingly recognised that developing their network of contacts helped them to expand their sphere of influence beyond their network of direct ties in ways which added value to the way that they did business. The potential of the networks as a resource to help them to identify opportunities, to access new resources or to obtain information and confirmation of their decisions to develop and grow their business was universally recognised. The prospects of achieving the fullest potential of managing networked relationships effectively appeared to depend, for both male and female entrepreneurs, on issues of trust and of confidence. The level to which such trust and confidence was possible was determined, it seemed, by such issues as length of time the relationship had endured, the nature of the experiences between the actors in the relationship, and the degree to which each actor in the relationship, male or female, could see that the benefits of membership, both intrinsic and extrinsic, on balance, outweighed the costs, on an ongoing basis.

However, the evidence would also suggest that there is a deal more that is deliberate about how those involved in the research managed their network of relationships. As discussed above, the purposes for engaging in any networking activity appeared to be, predominantly, the generation of information about some potential market prospect or business opportunity, and the management of key resources. In addition, the validation of key strategic decisions made which had a bearing on the potential of the firm to survive and thrive emerged again and again as an important purpose for developing and managing networked relations. The interviewees recognised the potential in their network of contacts for support from peers and professionals outside the firm and colleagues within it for accessing a sympathetic ear, particularly at times when circumstances were adverse and, consequently, stressful.

What appeared to emerge from the data was that networked relations were managed in a much more thoughtful way than their protestations would suggest. In discussion after discussion it appeared that interviewees were utilising networks as and when needed. The evidence suggested that the entrepreneurs were quite deliberate about how they managed their network of relationships, suggesting an approach where interviewees exercise a judgement as to who they might best contact when making a particular decision or to resolve a particular problem and when to reach out to that contact. They also appeared to be clear as to why certain people were included in their network. Thus, both male and female participants, as successful entrepreneurs, looked very much the same when it came to managing their networking activity.

These findings contrast with some of those reported earlier in the literature which suggested that men and women might network in different ways and that women experience problems with respect to network quality. The findings of this qualitative, comparative research point to marked similarities in the ways in which these men and women operating ventures in technology-based sectors developed quality in their networked relationships. It is quite possible that this lack of difference, elicited in the entrepreneurs’
own words, might be associated with the technology-based environment in which the entrepreneurs ran their business. Technology firms function in dynamic environments where it is important to develop effective and sustainable ventures if they are to endure and reach maturity; arguably, the environment will not tolerate for long inefficient business practices, including networking which is an important way in which to access critical resources vital for technology venture growth. Whilst the average age of the female-owned firms in the research was lower than that of the male-owned ventures, all have survived for five years or more, so may be considered mature businesses and their entrepreneurs experienced ventures. this suggests that practices in both male and female-owned ventures have delivered sustainable businesses. It is acknowledged that survivor bias may have resulted in the removal of the most inefficient firms.

Entrepreneurship is associated with being a male-type activity; arguably, venturing in technology sectors is even more male in character. Similarities in network quality may result from women having become accustomed to operating in a male-dominated environment where they have developed networking approaches reminiscent of those of their male counterparts in order to develop ventures capable of growing to maturity. Women who persist to establish SET firms learn the ways and mores of technology venture development through education and work in environments where men dominate and establish the baseline for “how things are done”; it is not surprising, therefore, that they exhibit patterns of behaviour and create structures which are much like those of male entrepreneurs. Future research might explore approaches in less male-dominated sectors to see if there is perhaps greater scope for marked variability in approaches.

At a policy level, the research suggests that these female SET entrepreneurs are not behaving, with respect to networks and networking, in ways which are in danger of damaging the growth potential and long-term viability of their individual firms, and, in aggregate, their wider economic contribution. It is important that encouragement and support be provided to those entrepreneurs of both genders who may be reticent with regard to “getting out there” and networking for business development and growth, since networking to access resources and win business is important for all entrepreneurs and their ventures.

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