

Tracing the Historical Foundations of Social Networks in Entrepreneurship Research

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Objectives: The objective of this paper is to consider the historical and intellectual roots of social network theory within entrepreneurship research. It will highlight the origins of entrepreneurial social network perspectives and how key theoretical views have been applied within entrepreneurship research to try and understand the entrepreneur and the process in which he/she is immersed. In doing so it will also examine the way in which interdisciplinary approaches linked to history enhance our understanding of the networked innovating entrepreneur.

Prior Work: The field of entrepreneurship has seen a dramatic increase in studies focusing on networks and social relations. This is particularly evident amongst European scholars where network research has emerged as a popular theme since the turn of the century (Uhlener, 2002). Such interest can partly be attributed to scholars moving away from dealing with the entrepreneur in isolation and instead looking to the consequences of embeddedness and the impact, implications and relevance of networks for entrepreneurship (Hoang and Antoncic, 2002). This line of enquiry has come about as a reaction against the view that the entrepreneur is an atomistic, isolated economic actor, undersocialised and immersed in a process quite different from other social phenomena (Araujo and Easton, 1996; Hoang and Antoncic, 2002). Instead, current thinking is that social relations and the social context can not only influence entrepreneurship but that because economic action is embedded, social networks can affect and influence economic performance and consequently the shape and form of entrepreneurial outcomes (Granovetter, 1992; Ring and Van de Ven, 1992; Snow et al., 1992; Jones et al., 1997; Arrow, 2000; Jack and Anderson, 2002). Yet, although network research has increased in popularity in recent years within the field of entrepreneurship, the network approach itself is not new. In fact, the network concept has been used in organizational research since the 1930's and at least the 1950's in sociology and anthropology (Nohria, 1992). And, although its use and popularity by social science researchers has without doubt intensified in recent years, much is owed to its founding disciplines which are often overlooked (Parkhe et al, 2006).

Approach: In this paper we trace the theoretical origins of network research back to three broad schools of thought (sociology, anthropology and role theory) and demonstrate how social network theory has been applied, translated and transferred to the entrepreneurial context as a mechanism for increasing understanding about entrepreneurship but also how entrepreneurship research has helped understand social network theory at a wider level.

Results: This paper helps support a concern raised in the literature, that there is a need to view networks using historical, spatial and temporal perspectives (Schutjens and Stam, 2003; Jack and Rose, 2010) and through the discussion, thoughts and ideas presented demonstrates that this is undoubtedly aided by drawing on history and historically based theories. The discussion also demonstrates how interdisciplinarity is a crucial feature of the study of networks and how academic boundaries still remain surprisingly overlooked even in closely related areas. Business history provides a clear example of an area that has developed in a separate silo, often going unnoticed. One consequence of this is "the spread of influential theories based on ill-informed understandings of the past" (Jones, 2008). Yet, theories informed by history might significantly enhance understanding of the relationship between entrepreneurship, networks and innovation significantly. For instance, some recent research has integrated historical methodology with analysis of the innovative enterprise and produced interesting results (O'Sullivan, 2000; Lazonick, 2003).

Value: Demonstrates how placing social network theory within a historical context enhances understanding about the networked innovating entrepreneur.

Introduction

The field of entrepreneurship has seen a dramatic increase in studies focusing on networks and social relations. This is particularly evident amongst European scholars where network research has emerged as a popular theme since the turn of the century (Uhlener, 2002). Such interest can partly be attributed to scholars moving away from dealing with the entrepreneur in isolation and instead looking to the consequences of embeddedness and the impact, implications and relevance of networks for entrepreneurship (Hoang and Antoncic, 2002). This line of enquiry has possibly come about as a reaction against the view that the entrepreneur is an atomistic, isolated economic actor, undersocialised and immersed in a process quite different from other social phenomena (Araujo and Easton, 1996; Hoang and Antoncic, 2002). Instead, current thinking seems to be that social relations and the social context can not only influence entrepreneurship but, because economic action is embedded, social networks can impact on economic performance and consequently the shape and form of entrepreneurial outcomes (Granovetter, 1992; Ring and Van de Ven, 1992; Snow et al., 1992; Jones et al., 1997; Arrow, 2000; Jack and Anderson, 2002).

A social network can be defined as “the actual set of links of all kinds amongst a set of individuals” (Mitchell, 1973) and “sets of ties linking several actors” (Nelson, 1988, p.40). The general understanding is that links such as friends of friends (Boissevain, 1974), group obligations (Bourdieu, 1986) and strong and weak ties (Granovetter, 1973) provide those who are party to a particular network with privileged information, access to opportunities and enable individuals to obtain resources that might be difficult to access otherwise (Jack, 2005). Within the entrepreneurial context a network has been described as “a set of actors and some set of relationships that link them” (Hoang and Antoncic, 2003, p.167). Such networks are argued to be important for entrepreneurship because the entrepreneur is motivated by relations with socialising agents (Aldrich and Zimmer, 1986). For example, Brüderl and Preisendörfer (1998) pointed out that through social ties and social activity existing social relationships are activated and new ones created to obtain resources for entrepreneurial activity. Networks have, therefore, been described as a stimulant to entrepreneurial activity (Brüderl and Preisendörfer, 1998: 214), with the information and resources gathered through networks compensating for environmental constraints and facilitating the entrepreneurial process (Chell and Baines, 2000). Given the importance and relevance placed on networks it is probably not too surprising that entrepreneurs are increasingly perceived to rely on their social networks for economic purposes (Bloodgood *et al*, 1995: 126), nor that a network has been described as one of the most powerful assets an entrepreneur can possess as it provides access to power, information, knowledge, capital and other networks (Birley, 1985; Aldrich and Zimmer, 1986; Johannisson, 1987; Elfring and Hulsink, 2002).

The purpose of this paper is to demonstrate the historical and intellectual roots of social network theory within entrepreneurship research. In doing so, this paper will highlight the theoretical origins of the entrepreneurial network perspective. We begin by exploring the origins of social network theory. The discussion will then demonstrate how the term along with key concepts have been applied within entrepreneurship research and used to try and understand the entrepreneur and process in which he/she is immersed. Thereafter we will examine the way in which interdisciplinary approaches linked to history enhance our understanding of the networked innovating entrepreneur. Following on from this we explore the ways in which networks may act as a constraint to entrepreneurship. Finally, we consider potential future directions for research. By combining the discussion of social network theory, entrepreneurship, innovation and history this paper explores how such combinations enrich our understanding of entrepreneurship and entrepreneurial processes.

Theoretical origins

It is difficult to identify when the term “social network” was first used. The social network approach seems to have emerged from dissatisfaction with a strictly structural approach and was seen to offer a deeper understanding of human behaviour (Boissevain and Mitchell, 1973). Historically the term “a network of social relations” was used to represent a complex set of inter-relationships in a social system” but prior to the 1950s it tended to be used as a metaphorical way of looking at things rather than as an analytical concept (Mitchell, 1969: 1). Early writings suggest that network theory was seen as key to bridging sociological analysis of human behaviour and personal/motivational aspects (Noble, 1973). Early studies defined networks as “the set of persons who can get in touch with each other” and contacts as “the individuals who comprise a network” (Katz, 1966: 203). However, others have said it is better to think of a network as “the set of linkages among persons and contacts as the set of persons connected by these linkages” (Mitchell, 1969: 4).

Social network theory has been used to demonstrate the nature and effect of the interaction and exchange that takes place between individuals (Harland, 1995; Maguire, 1983). It perceives individuals as being related to each other by sets of transactions which have implications for the actors wider than the exchange itself (Mitchell, 1973). A network perspective illustrates that people are dependent on others and that the individual is an interacting social being able to manipulate others and be manipulated by others (Boissevain, 1973). According to Banck (1973) there are also three notions about a social network that are perceived to be important. These are that 1) ego has social relations with other individuals, who in turn have social relations

with others, either directly linked with ego or not, 2) ego is entangled in a network of social relations, the structure of which influences the behaviour of ego and 3) the individual is supposed to be able to manipulate to a certain measure the social network for his/her own ends (Banck, 1973).

Theoretical origins of network research can be traced to three broad schools of thought: sociology, anthropology and role theory (Tichy et al., 1979; Nohria and Eccles, 1992). Tichy et al's (1979) work demonstrates the historical foundations of socio perspectives of network research. The routes of social network theory lie in sociology and anthropology where initially we are introduced to the ideas of the sociologist Park (1924; 1926). According to Park (1924; 1926) society exists through communication and, by communicating with other individuals, experiences are shared and life is maintained. Park's (1924) ideas were based on the concept of social distance; "the individual who is not concerned about his status in some society is a hermit, even when his seclusion is a city crowd. The individual whose conception of himself is not at all determined by the conceptions that other persons have of him is probably insane.....A person is simply an individual who has somewhere, in some society, social status; but status turns out finally to be a matter of distance – social distance" (p. 10). In developing his point Park (1924) goes on to argue that in all our personal relationships we are clearly conscious of the degree of intimacy with others. In later work Park (1926) pointed out that while it is the relations that individuals have with and to others that are important, social interaction is an aspect of social phenomena that comes about as a result of changing attitude, the social experiences of the individual and the inhibiting effect of self-consciousness. Moreover, Park (1926) described social relations as far from homogeneous and subject to change. This notion of interaction runs through much of the early writings regarded as being core to the foundations of social network theory. Simmel (1950) argues that interactions produce society and that it is through linking together and coming together that people are tied to others. Thus, it is not purely interaction which is important but the ties which people have to others and how these ties might impact on individuals, effect and influence the way they live their lives. Cooley (1956) introduces us more directly to the idea of individuals contributing to social life and that it is the process of how they choose and the choices that they make in terms of interaction which are interesting aspects. Cooley (1956) also discusses how in order to have society it is necessary that people get together somewhere but any study of society must be supported by a good understanding of personal ideas. So, while these early writings introduce us to the idea of the social element in people's lives they do not lose sight of the individual. Instead they perceive the individual as a social animal immersed in a social process.

The 1950s saw quite a dramatic increase in the number of studies looking at links, exchange and reciprocity in terms of social behaviour and more use of the actual term social network itself. Initial work using the notion of social networks tended to concentrate on the nature of links among people as this was perceived as the most significant feature (Barnes refers to this as "mesh" and Bott as "connectedness") (Mitchell, 1969). Early studies included the work of Barnes (1954) who drew on Fortes (1949) ideas about the *Web of Kinship* to develop the idea of using a social network to describe and consider the social behaviour of individuals and their behaviour with others with whom he/she may not necessarily be in touch with directly. Barnes (1954) is certainly one of the first to use the term "social network" in a more systematic way (Noble, 1973). However, Bott (1955, 1956, 1957) is considered one of the first to actually apply the term social network in a more analytical way (Noble, 1973). Bott's (1955, 1956, 1957) work on conjugal roles and the patterns of relationships in London families began to develop the idea of close knit/loose knit networks more extensively. Mayer (1961, 1962, 1964) and Pauw (1963) used the idea of a social network to consider the behaviour of types of migrants in London and concentrated specifically on a point drawn out in Bott's work that "the behaviour of people who are members of a "close knit" group of friends is likely to be considerably influenced by the wishes and expectations of these friends as a whole, while those whose acquaintances do not know one another may behave inconsistently from time to time without involving themselves in embarrassment" (Mitchell, 1969). Epstein (1961) was probably one of the first to begin to question variation in different parts of a network and relate this more specifically to interaction (Noble, 1973). Parson's (1968) refers to the relevance of the interaction processes and the significance of the structures of relationships among actors, the recurring nature of these relations and the systems of norms and expectations that exist within and between relations but also society as a whole. These aspects are also evident from other studies written around the area. So, for example, Bott's (1955; 1957) work on families and kinship, Granovetter's (1973) work on strong and weak ties and the labor market and Padgett and Ansell's (1993) work on political parties and elite networks would all claim to be concerned with what actually takes place in people's lives, the relations in which individuals are embedded and how relations might impact on behaviour. Moreover, such studies do not lose sight of the individual but also take the perspective that he/she is immersed in social relations which can have an impact.

The theory of social exchange originated in social anthropology with people like Frazer (1919), Malinowski (1922), Levi-Strauss (1969) and Bohannan (1955) (Ekeh, 1974). Certain unit ideas of social exchange theory are evident throughout sociological writings and really demonstrate the significance of exchange (Ekeh, 1974). And while they might receive varying emphasis and approval or disapproval from social exchange theorists, the following seem to be regarded as being central to social exchange theory: 1) the relationship between

economic exchange and social exchange; b) the structure of reciprocity; c) restricted exchange and generalized exchange; d) exploitation and power; and e) the contribution of social exchange processes to social solidarity (Ekeh, 1974). Examples of scholars writing about social exchange theory include Homans (1961) and Levi-Strauss (1969). For example, Homans (1961) talks about interaction and social contacts and describes social behaviour as representing an “exchange of activity, tangible or intangible, and more or less rewarding or costly, between at least two persons” (p.13). Homans (1961) also describes how one individual might change (even influence) the behaviour of others. Central to Levi-Strauss’ (1969) theory of social exchange is the idea and principle of reciprocity, a social usage consisting of what he refers to as univocal or directional reciprocity (Levi-Strauss, 1969). Blau (1964) argues that social exchange is an underlying factor in relations between individuals and groups. He argues that the basic idea of social exchange is based on reciprocity and social reward so the mutual exchange that occurs over time creates a social bond between individuals. Social exchange is considered to be an underlying factor in relations between individuals and groups (Blau, 1964). Blau (1964) argues that individuals associate with one another because they can profit from the other and through being associated with the other. Certainly aspects of exchange and reciprocity really lie at the very heart of social network theory. Malinowski’s (1922) ethnographical account of life as a native in the South Sea Islands demonstrates the nature of exchange, sociological relations, especially family and group members, and the mechanisms used for exchange between individuals. This work also shows ties exist between individuals and demonstrates the importance of give and take to the social fabric of a society.

What is clear from this fairly brief historical review is that early work within both sociology and anthropology identified elements which appear to be relevant to network theory. That is that the human being is a social being embedded within a social context; a being that is immersed in a network of relationships with whom reciprocal exchange is expected and anticipated to take place and that these relationships can be manipulated by all parties involved so that if and when made manifest, they can impact on the individuals involved in many different ways and with varying consequences.

Social Network theory and entrepreneurship

It is on these foundations that entrepreneurial social network theory has and is being built. In doing so, entrepreneurship scholars have drawn on and built upon many of the concepts presented and associated with these foundations of social network theory. Within entrepreneurship the social network perspective can really be regarded as the primary focus of the majority of research. It is also the most prolific in terms of the development of data analysis tools and their application to a range of social science topics (Araujo and Easton, 1996). The definitions of a network presented earlier in the introductory section emphasise the notion of actors and links between actors. Within the field of entrepreneurship, the personal network perspective is based on the principle that entrepreneurship is a social role (Brüderl and Preisendörfer, 1998).

Networks represent the “collaborative” relationships formed by individuals within firms, with other firms and with other organisations. Networking itself involves a social process which takes place over time (Jack, 2005). It is a process of identifying common interests, gaining knowledge and experience of other individuals and building trust, a crucial element of networks. The actual activity of networking has been described as a “system by which entrepreneurs can tap resources that are external to them, i.e. that they do not control” (Jarillo, 1989: 133). As a consequence, “entrepreneurs can, in theory, take advantage of the wider social network in which their ties are embedded (Kim and Aldrich, 2005: 2). Networks involve links with and to the social structure with such links providing information, creating opportunities and enabling resources to be accessed (Uzzi, 1997; Premaratne, 2001; Florin et al, 2003; Hite, 2005). Moreover, links to the social structure and the level/extent to which an individual is embedded can influence, affect and impact on the shape and form of economic outcomes (Uzzi, 1997; Chell and Baines, 2000; McDade and Spring, 2005). Given the emphasis placed on networks it is not too surprising that we are seeing an increasing number of studies focusing on networks and entrepreneurship.

The number of studies focusing on networks and relations in and between individuals has increased dramatically (Hoang and Antoncic, 2003; Parkhe et al, 2006). The actual extent of the popularity of network research is evident from a review of key academic journals between 1995 and 2005 (Jack, 2009). During this period a total of 71 articles relating to a range of themes and aspects and using a variety of contexts were published (Jack, 2009).

What studies have shown is that networks not only influence individuals but can also impact significantly on the ways in which organizations are managed, developed, maintained and sustained (Halinen et al., 1999; Nelson, 2001; Ahuja, 2002; Karamanos, 2003). Recent claims are that networks are even “reshaping the global business architecture” (Parkhe, 2006, p 560). Assuming this is the case, then understanding networks has important theoretical and practical consequences, particularly in grasping how entrepreneurs and their organizations operate and function (Jack, 2009). There is a wide body of literature forming and consensus about the significance of networks for entrepreneurship, much less is known about why they may go wrong

and what the consequences might be, how they may change in configuration and capability through time and the differences in networking behaviour among different categories of entrepreneurs in different cultures (Dodd et al, 2007).

A criticism of work that has been carried out is that rather than focusing on process related issues, as earlier sociological work did, studies have tended to be more concerned with looking at structural aspects of networks, particular elements related to structure and outcomes such as network ties. However, while network research has been criticised for this, since Hoang and Antoncic's (2003) critique of the network literature and "cry" for more process work, process related issues are starting to become more popular (Jack, 2009; Slotte-Kock and Coviello, 2010). However, to-date structural aspects of entrepreneurial networks have received more attention than processual issues (Hoang and Antoncic, 2003; O'Donnell et al, 2001; Jack, 2009; Slotte-Kock and Coviello, 2009). As a consequence, we realise and recognise structural features associated with the constitution of networks. We know networks are formed on the basis of relationships; that tie relational homogeneity, diversity, density and the extent to which individuals within a network know each other are relevant issues; that ties vary in terms of strength, that there are different measures of centrality and reachability (see Kim and Aldrich (2005)). We also know that networks enable individuals to access resources and social support (Renzulli and Aldrich, 2005). However, we know much less about the downside of networks.

Conceptual Roots of Social Networks

In tracing the roots of social network research there are some concepts which have been used and applied to the study of entrepreneurial networks. In the following a selection are referred to to illustrate how understanding has been shaped.

Strength of weak ties

Most network studies looking at ties are characterized by the use and application of Granovetter's strong and weak tie hypothesis (for examples, see Aldrich et al., 1987; Hills et al., 1997 amongst others). Granovetter (1973), and subsequently Burt (1992a; 1992b), argued that a network should consist of both strong and weak ties because the nature of these ties influences the operation and structure of networks (Jack, 2005). Weak ties represent heterogeneous ties and are perceived to be a critical element of social structure, enabling information to flow into other social clusters and the broader society (Burt, 1992a), hence the possibility of connections to other social systems (Ibarra, 1993). Contrastingly, strong ties are perceived as less beneficial than weak ties because they are likely to provide redundant information since they can be anticipated to move in similar, if not the same, social circles (Granovetter, 1985; Burt, 1992b). Thus, the homogeneity of strong ties is thought to be less effective, breeding local cohesion but also leading to overall fragmentation (Granovetter, 1973; Ibarra, 1993; Maguire, 1983). However, cumulating evidence that emphasises the importance of weak ties has fuelled the debate on the relative value of strong versus weak ties (Hoang and Antoncic, 2003; Jack, 2005). So, whilst the strong and weak tie hypothesis has become an established paradigm, questions arise over its applicability particularly within the context of entrepreneurship (Bruderl and Preisendorfer, 1998; Elfring and Hulsink, 2003; Jack, 2005). Network ties, particularly for emerging firms, provide the "conduits, bridges and pathways" to opportunities and resources but the characteristics of these ties influence how they are "identified, accessed, mobilized and exploited" (Hite, 2005, p. 113). So, the ties that form a network can have a significant impact on the type and extent of resources acquired (Jack, 2005).

Embeddedness

Granovetter (1985) also argued that actors are said to be embedded in concrete, ongoing systems of social relations and that behaviour is so constrained by ongoing social relations that to construe them as independent is a misunderstanding. According to Uzzi (1997: 1), research into embeddedness can help to advance understanding of how social structure affects economic life. He referred to embeddedness as "a puzzle that, once understood, can furnish tools for explicating not only organisational puzzles but market processes" (Uzzi, 1997: 22). As Carsrud and Johnson (1989) note, the new business development process is strongly affected by social contacts or linkages which in fact form the patterns of social interaction. Burt (1992a) describes this as bridging "structural" holes. Social embeddedness is relevant to entrepreneurship because it helps the entrepreneur identify social resources, an essential step to founding organisations (Hansen, 1995). Furthermore, being embedded within the social context means access to more support during the entrepreneurial process but also a likelihood of increased entrepreneurial activity (Schell and Davig, 1981).

However, embeddedness can also act as a constraint. Uzzi (1997: 17) identified conditions when embeddedness can be turned into a liability, for example: the unforeseeable exit of a core network player; institutional forces rationalising markets; even over-embeddedness. Embeddedness can also influence the way in which value is and can be extracted - affecting resource availability, opportunity perception and shaping the entrepreneurial event. Steier and Greenwood (1995: 349) provided an account of the problems

encountered when venture capitalists withdraw funding from an enterprise. Anderson and Jack (2000) illustrated that the social stigma attached to failure in small, close communities where everybody knows each other, can have tragic consequences. Even Schumpeter (1934: 87) provided an account of how those within the social context can react against someone who wishes to do something new by condemning it, simply because it is an unfamiliar procedure: "Even a deviation from social custom in such things as dress or manners arouses opposition....this opposition is stronger in primitive stages of culture than others, but is never absent. Even mere astonishment at the deviation, even merely noticing it, exercises a pressure on the individual. The manifestation of condemnation may at once bring noticeable consequences in its train. It may even come to social ostracism and finally to physical prevention or to direct attack" Schumpeter (1934: 87). So, the fear of social exclusion could prevent any individual activity which would not be acceptable to the group (Schumpeter, 1934). Similarly, Johannisson (1990) argued that individual entrepreneurs take both economic and social risks which may lead to social exclusion while Anderson and Jack (2000) illustrated that social embeddedness can also have negative effects because of group expectations.

Structural holes

Burt's (1992a: 28) structural holes thesis deals with the hole, or gap, which is spanned between non-redundant contacts; "whether a relationship is strong or weak it generates information benefits when it is as bridge over a structural hole". Network contacts are redundant if they lead to the same people and hence provide the same information benefits, i.e. each person knows what the other people know (Burt, 1992). Therefore, it is the number of non-redundant contacts which becomes important. Non-redundant contacts are disconnected in some way - "either directly in the sense of no direct contact or indirectly in the sense of one having contacts that exclude others" (Burt, 1992b: 65). The structural holes argument is linked to the strength of ties and homogeneity. Burt's (1992; 1992b) thesis deals with the hole spanned between non-redundant contacts since it is this (structural) hole which he argues is important in generating information benefits.

Although in Burt's (1992a; 1992b) view it is the space between the links (in a network) which is effective and important, the real value of the structural holes argument is in helping to understand the size of the hole and what is actually going on within that hole, particularly if a network is visualised as a grid of mutuality, where people with some commonality are brought together for a variety of reasons. Where contacts have no direct ties with one another, they are non-redundant because each can lead to different information and resources. Accordingly, network positions associated with the highest economic return lie between not within dense regions of relationships, i.e. structural holes (Walker et al, 1997). In the context of entrepreneurship this is relevant because it infers that structural holes may present opportunities for brokering information flows among firms and, consequently, this offers the possibility of greater economic payoffs as potentials are created (Walker et al, 1997).

Social capital

In the literature of political science, sociology and anthropology, the idea of social capital has been used to refer to the set of norms, networks and organisations through which people gain access to power and resources that are instrumental in enabling decision-making and policy formulation (Serageldin and Grootaert, 2000: 45). Social capital is partly the social glue that produces cohesion; it may be thought of as a collection of networks, i.e. the "social group" into which one is socialised or aspires to be socialised; it is an aggregation of reputations and a way to sort out reputations; and it includes the organisational capital that managers develop through their management style (Stiglitz, 2000: 60). Relations within and beyond the firm have been referred to as social capital (Burt, 1992b: 58). It is a feature of social networks which facilitates co-ordination and co-operation for mutual benefit (Flora, 1998: 488). So, it can also be viewed as sets of resources embedded in relationships (Burt, 1992a; Burt, 1992b). Social capital includes many aspects of the social context which involve social interaction, such as social ties, trusting relationships and value systems which facilitate the actions of individuals located in a particular social context (Nahapiet and Ghoshal, 1998; Tsai and Ghoshal, 1998). According to Anderson et al (2007) social capital can be considered a productive asset, making possible certain ends which, in the absence of social capital, would not be possible, or would be more difficult (Coleman, 2000). An actor's embeddedness in social structures endows them with social capital (Portes and Sensenbrenner, 1993; Oinas, 1999). Hence social capital is created within the embedding process; an end (a product of networks) as well as a means (of enabling) (Anderson and Jack, 2002; Jack and Anderson, 2002). According to Walker et al (1997) in the entrepreneurial context firms with less social capital are more vulnerable to opportunistic behaviour and less able to build an enduring history of effective cooperative behaviour with partners over time and have to spend more time and effort monitoring the relationship. In contrast, the more social capital available to a firm, the fewer resources it needs to manage existing relationships and the more resources it can use to establish new ones (Walker et al, 1997).

In the following part of this paper we broaden the discussion about the disciplinary roots and demonstrate how links to history enhance our knowledge. Taking the discussion forward in this way is interesting because it helps broaden understanding about the networked innovating entrepreneur.

New Combinations

The above discussion has demonstrated the extent to which the study of entrepreneurial networks has been enriched by the application of theories based on sociology and social anthropology. Yet if interdisciplinarity is a crucial feature of the study of networks, academic boundaries still remain surprisingly acute even in closely related areas (Brazeal and Herbert, 1999).

Geoff Jones observed that despite having much to offer the study of entrepreneurship and management, business history has developed in a separate silo, which has 'resulted in the spread of influential theories based on ill-informed understandings of the past'. (Silverthorne, 2008) In this context Schumpeter's emphasis on the potential for co-evolution of knowledge by economists and economic historians is especially apposite. (Schumpeter, 1947) The creative impact of 'new combinations' on the economic system is equally applicable to academic research, where innovation takes place at the boundaries of disciplines drawing together complementary approaches. In this section we explore both the origins and evolution of theories informed by history and show how they can be combined to develop understanding of the relationship between entrepreneurship, networks and innovation.

Schumpeter, entrepreneurship, history and path dependency

This paper has already traced the development of sociologically based theories on entrepreneurship. Understanding the relationship between innovation, entrepreneurship, history and networks adds dimension generally lacking from studies based on social theory. It inevitably takes us back to Joseph Schumpeter, for whom innovation and entrepreneurship were the dynamic engines of change at the heart of capitalist growth and were inseparable from historical context. (Schumpeter 1934; Schumpeter, 1947). Some recent research has integrated historical methodology with analysis of the innovative enterprise (O'Sullivan, 2000; Lazonick, 2003).

Scholars have challenged the role of the Schumpeter's 'hero entrepreneur' at the heart of economic development. (Cassis and Minoglou 2005, 10) However, embedding the entrepreneur within a shifting set of networks, implied by Schumpeter's 'new combinations' provides a dynamic landscape for understanding the innovative entrepreneur and the impact which he or she may have on economies, on regions and on firms. History then is not just about the past. It can be used to understand the present and the future. The links between past and future and the cumulative nature of innovation, are the result of the social learning processes associated with it (Lazonick, 2003).

Path Dependency

Historical analysis and several theories underpinned by history, including path dependency and communities of practice, help us make sense of networking behaviour by entrepreneurs. Path dependency, or the influence of past events and knowledge on the future, was originated by the economist, Paul David. Paul David was one of the pioneers of the 'new economic history' combining economics, cliometrics and history to make sense of the economic growth process. (David 1975) His interest in path dependency grew out of this work and he argued that the solution of comparatively small problems in the past provide the foundation for the choices of the future. The long term impact of 'learning by doing' on human behaviour potentially leads to 'lock in', as in the case of the QWERTY keyboard (David 1985).

Path dependency has been largely overlooked by scholars of entrepreneurship, (Jones and Wadhwani, 2005). At first glance the 'locking in' of behaviours and activities seems the very antithesis of entrepreneurship, innovation and change. But, if we are to move from generic theories of entrepreneurship to those which explain regional and international differences in behaviour, it is vital to appreciate the forces shaping choices. The application of institutional and evolutionary theories - which themselves draw on both Schumpeter and path dependency theory- help to explain such differences. (Nelson and Winter, 1982; North 1990) 'Institutions are the rules of the game in a society or, more formally, are the humanly-devised constraints that shape human interaction'. (North 1990) They may either be the formal laws created by governments or the informal codes of practice and of behaviour found in organisations, communities, regions or countries. They help to create order and form the basis for co-operation in an uncertain world. For example, formal laws and regulations are the basis of property rights, whilst informal codes underpin trust and shape expectations of the likely behaviour of associates.

The idea that 'institutions matter' and that understanding the rules of the game is crucial to an appreciation of economic behaviour underpins the 'new institutional theory' of North, Williamson, Hodgson and Casson. (Williamson 1988; Williamson 2000; Hodgson 1988; Casson 1991) Yet Williamson does not explain the international diversity of experience and has been strongly criticised by sociologists and some economists for his neglect of networks. Starting with the assumption that firms are embedded within the society of which they

are part, it has been demonstrated that in East Asia, for example, firms are inseparable from their socially based networks. In this context, networks are not an intermediate stage between firm and market as Williamson implies, but constitute the norm. (Redding, 1990; Biggart and Hamilton 1992). Additionally, drawing on evolutionary theory, some economists have pointed to the path dependency of innovation, showing the impact of firm specific routines on the choice of technology, which helps to explain divergent as opposed to convergent business behaviour. (Langlois and Robertson, 1995)

Entrepreneurs never, therefore, innovate in isolation, so links to investors, competitors, suppliers, customer and governmental organisations need to be considered when studying innovation. (Lundvall, 1992; Edquist 1997) By setting innovation behaviour against the formal and informal rules of the game business historians and economists have explored the potential of the 'new institutionalism' for international comparisons. (Zysman 1994; Casson and Rose 1997; Knutsen, Rose and Sjogren 1999) During the 1990s a number of business historians demonstrated that entrepreneurial, and indeed family, firms were embedded within distinctive regional and sometimes international networks, from which they derived competitive advantage. (Scranton, 1997; Rose 2000) In this work networks were a dynamic phenomenon and acted as a bridge between past and future.

Schumpeter saw innovation as evolutionary. But it is by moving beyond the individual entrepreneur to the embedded entrepreneur that the combination of theory and history becomes especially powerful. This is because innovation is a knowledge-based process, where the entrepreneur combines bodies of skill and expertise. Since innovation occurs most readily at the interstices of areas of expertise this is enhanced by entrepreneurial networks, which facilitate boundary crossing. Entrepreneurial networks have increasingly been identified as crucial to innovation. Much has been written identifying the importance of networks to combinations of knowledge in the supply chain. (Powell and Grodal, 2005:75)

Yet networks are not just crucial for vertical collaboration within the supply chain, they are significant when boundary crossing involves mixing old and new knowledge and the avoidance of path dependent 'lock in'. Work that draws on Schumpeter emphasises how the majority of designs and innovations represent 'new combinations of old and new' – old product and new process, old product and new material, old skills and new products. (Abernathy & Clark, 1985)

Schumpeter (1947) believed the trajectory of any innovation was intimately related to its historical context, and argued that creativity involves not necessarily developing something new, but having the imagination to see old things in new ways and move 'outside the ruts of established practice'. Creativity alone does not lead to commercialized innovations and it is here that the link with entrepreneurship and entrepreneurial networks becomes crucial. Entrepreneurship involves the recognition and assessment of opportunities and is often the bridge between creativity and innovation. Innovation is, by implication, an evolutionary process with the discontinuities typically coming from boundary crossing, which leads to new combinations. It is entrepreneurial imagination that transforms the shadow of the past into an inspiration for the future. The entrepreneur is involved in what can be described as the dance of two questions – what is needed and what is possible - and the interplay of these two questions is an ongoing process. Responses to the two questions are shaped by changing knowledge of the external environment, by social and business networks, by changes in the legal system, changes in the competitive environment and by market forces (Stefik and Stefik, 2004). Viewed in this light, networks underpin development and change in economies, sectors and firms. Based upon knowledge, they are inseparable from a dynamic approach to the co-evolution of innovation in industries. (Malerba, 2006)

Rather than staying trapped by their past, networked entrepreneurs may engage in 'mindful deviation' and in so doing create new innovative pathways. Theorists setting out to develop beyond path dependency to path creation have shown that this can be achieved by a combination of external and internal awareness or receptivity to the unfamiliar, combined with an understanding of the need to convince hearts and minds of the benefits of change. (Garud and Karnøe 2001:6; Bessant, Birkinshaw, and Delbridge 2004: 32-3) All this implies that the dynamic dance of two questions, what is needed and what is possible, will not be conducted in isolation, but will be embedded in and underpinned by social networks within and outside firms. (Garud and Karnøe 2001:20).

Communities of Practice

This paper has already revealed the importance of anthropology in shaping thinking on networks, social change and social capital. The impact extends to innovation through the development of the concept of communities of practice. The communities of practice literature provides an exciting bridge between entrepreneurship, innovation and networks and one which is underpinned by historical path dependency models of 'learning by doing' already discussed. Although informal communities of practice have always existed, the term was first used by anthropologist Jean Lave and educationalist Etienne Wenger in 1987 as

part of their analysis of apprenticeship. (Wenger and Snyder 2000) Formalised and developed by Lave and Wenger during the 1990s, this social learning theory is based on the experiential learning achieved within groups united by the shared passion for and practice of particular activities. Sharing history and experience brings with it free flowing communication which in turn fosters a creative and innovative solution to problems. (Lave and Wenger 1991; Lave 1993; Lave and Chaikin 1993; Wenger 1998) Communities of practice theory have been applied to explain diffusion of innovation, or the barriers to it in large scale companies (Brown and Duguid, 1991) and the entrepreneurial process within family firms. (Aldrich and Cliff, 2003). Although largely neglected in small firms, it has found applications in the context of local and regional entrepreneurial networks. Applied to the innovation process, this theory helps to explain the evolution of experience, knowledge and practices especially within industrial clusters. The analysis of Silicon Valley has revealed that the clustering of the same and related industries has created overlapping communities of practice which mean that entrepreneurial knowledge is 'in the air' (Brown and Duguid, 2002) Proximity to competitors reinforces awareness of the implications of their innovations and fine tunes opportunity recognition. In addition, there has developed a breed of venture capitalist experienced in hi-tech start ups while in universities, such as Berkeley and Stanford, academics are habitual entrepreneurs which reinforces and feeds the environment.(Brown and Duguid, 2002; Kenney and Goe, 2004).

The importance of communities of practice theory in entrepreneurial networks and innovation is not confined to industrial clusters, however and is also linked to the role of lead users in innovation identified by Von Hippel. Lead user innovators are those who innovate for use rather than sale and are consequently typically embedded within a community of practice. (Von Hippel, 1988; Von Hippel 2005) The development of this theory around both industrial users and consumers has important implications for our understanding of the role of entrepreneurial networks in innovation. It shifts the focus of innovation from the R&D department of the large scale company to networks of users and has been identified in hi tech and low tech sectors and especially in sports goods, strongly influencing designs and design processes. The majority of lead-users do not, however, become entrepreneurs and those that do are often lifestyle entrepreneurs. However where entrepreneurs are themselves users, and hence part of overlapping communities of practice, this can significantly enhance the quality of dialogue with their customers. (Von Hippel 2005; Lüthje, and Von Hippel, 2005; Baldwin, Hierneth and von Hippel 2006; Rose, Love and Parsons, 2007)

Conclusion: The Future for Social Network and Entrepreneurship Research

So, while network research within entrepreneurship has increased in popularity in recent years, the network approach itself is not new and has been used in organizational research since the 1930's and at least the 1950's in sociology and anthropology (Nohria, 1992). Although its use and popularity by social science researchers has without doubt intensified in recent years, much is owed to its founding disciplines which are often overlooked (Parkhe et al, 2006).

The productive information and resources gathered through social networks can compensate for constraints and the use of social networks can counteract many difficulties (Jack, 2005). However, as highlighted in our discussion the use of social networks can also be problematic. Yet, it is through social networks that entrepreneurial action can convert 'limited' resources into a 'rich environment' (Jack, 2005) but for the entrepreneur this can involve taking both economic and social risks. Despite considerable empirical and theoretical development (Hoang and Antoncic, 2003) there is a need to further understanding about particular aspects, for instance the embeddedness and the impact of social mechanisms (Jones et al., 1997); what really goes on within a network but over time by taking a process perspective (Hoang and Antoncic, 2003; Jack, 2009; Slotte-Kocke and Coviello, 2010); and issues surrounding the downside of networks.

There is a perspective that in terms of theory development network research is at the "cusp of an exciting new phase of advances", anticipated to "remain vibrant far into the future" (Parkhe et al, 2006: 567). It might even be the case that it is through relations, interactions and networks that entrepreneurship is really carried out (Anderson et al, 2005). So, by continuing to consider networks, by thinking about the networked innovating entrepreneur and by taking a historical perspective our understanding can only be enhanced.

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