

16. Entrepreneurship, Networks, and Geographies

INTRODUCTION

Entrepreneurship is increasingly the domain of organizations and regions, not individuals. These organizations and regions are environments rich in entrepreneurial opportunities and resources and they have been increasing in numbers and in varieties – be they technology licensing offices, bands of angels, venture capital firms, corporate venturing programs, or incubator firms and regions. These environments explicitly influence individuals by teaching them how to discover and exploit entrepreneurial opportunities. These environments also specifically influence new ventures, providing the resources to increase their rate of founding and survival. However, how these environments spawn new entrepreneurs and create new businesses remains relatively understudied.

Although these organizational and regional environments have been described as network structures (Florida and Kenney, 1988) and geographic clusters (Cooper and Folta, 2000), research that links the spatial and relational aspects of these larger contexts to the micro processes of entrepreneurship is relatively underdeveloped. In this review we take inventory of literatures on networks and geographies to examine how these environments affect the ability of entrepreneurs to garner scarce resources. We seek to address questions of how individuals are likely to become entrepreneurs within the context of why and where entrepreneurship is likely to occur. We define entrepreneurship as both the discovery and exploitation of entrepreneurial opportunities (Shane, 2000) and the creation of new organizations, which occur as a context-dependent social and economic process (Low and Abrahamson, 1997).

The study of entrepreneurship has a bifurcated history – typically focusing on either individuals or environments but not linking the two (Thornton, 1999). Supply-side theorists argued that individuals who possess particular psychological traits are more likely to become entrepreneurs and thereby account for the rate of entrepreneurship (Shaver and Scott, 1991). In contrast, demand-side theorists argued that individuals who are structurally situated in entrepreneurial environments are more likely to be entrepreneurs because the availability of opportunities encourages founders to emerge (Aldrich and Wiedenmayer, 1993). While the individual entrepreneur cannot mobilize without an infrastructure, it is also the case that social and economic structures are not actors (Sewell,



1992). Clearly, the discovery and exploitation of entrepreneurship is related to linking both person and place, with the founding of a firm dependent on both the actions of individuals and the structures of environments (Schoonhoven and Romanelli, 2001).

Earlier research in economics and sociology focused on the spatial and relational contexts of entrepreneurship – the demand-side. For example, Weber (1929) was concerned about the influences of hierarchies on innovation. Stinchcombe (1965) argued that it is easier to found organizations in a context that has more organizational experience. Turk (1970) found that organizations are more easily introduced and are more achievement oriented in an environment that is richly connected inter-organizationally. Frankel (1955) argued that the slow rate of diffusion of innovations around the turn of the century in the British textile, iron, and steel industries was due to the absence of vertically integrated firms. Marshall (1916) wrote about the influences of geographies on innovation and trade. However, as the fields of sociology and economics evolved, researchers increasingly shifted their attention to examining the characteristics of the entrepreneur as an abstract and universal actor, independent of the particular time and place.

Recently there has been a resurgence of research on the spatial and relational determinants of entrepreneurship. Two examples are how an entrepreneur's social capital – the quality of their referral network – determines their chances of receiving venture capital (Stuart et al., 1999), and how a region's cultural capital determines its ability to recruit human capital (Florida, 2002). While we can argue that spatial location in a network affects an individual's and an organization's chances for discovering and exploiting entrepreneurial opportunities (Burt, 1992; Warren, 1967), we know little about how this principle of networks applies to higher levels of analysis, such as geographic regions. At the same time, we know that geographic regions have been shown to exhibit entrepreneurial advantages based on differences in their network structures and cultures (Saxenian, 1992), however the micro processes of these mass effects are relatively understudied in large sample research.

Relational networks exist at multiple levels of analysis because they can tie together individuals, groups, firms, industries, geographic regions, and nation-states. They can tie members of any one of these categories to members of another category. For example, venture capital firms in their efforts to syndicate financing tie together incubator regions (Florida and Kenney, 1988). The location of the research university is pivotal to regional infrastructure because of its networking role in recruiting talent and transferring technology through multiple networks, such as placing students in industry, licensing intellectual property, and spinning-off companies (Powell, Koput, et al., 1996; Florida and Cohen, 1999). It is also the case that the individual characteristics of scientists determine the geographical location of entrepreneurship. The proximity of biotechnology companies and universities is shaped by the roles played by scientists, whether they be that of a star Nobel laureate or other grades of scientific talent that is “bait to the investment community” (Audretsch and



Stephan, 1996). It is through such multilevel ties that networks and geography are inexorably linked in the pursuit of entrepreneurship.

We organize our review first by levels of analysis, focusing on networks and then on geographies. We draw on theoretical perspectives to frame our review, for example, institutional, resource dependence, learning, and status. First, we define the concepts of networks and geographies; then we conclude each section by identifying questions for future research. We close our review by discussing the integration of the work on networks and geographies for the study of entrepreneurship.

DEFINING NETWORKS AND GEOGRAPHIES

Networks

Relational networks can be defined from a number of perspectives. Podolny and Page (1998: 3) define relational network forms of organization as any collection of actors (N [greater than equal to] 2) that pursues repeated enduring exchange relations with one another and, at the same time, lacks a legitimate organizational authority to arbitrate and resolve disputes that may arise during the exchange. Laumann (1991) argues that markets and hierarchies are two pure types of organization that can be represented with the basic analytic constructs of nodes and ties – that is, networks are the more general form of organization.

Relational networks are characterized as embedded, for example in social structures (Granovetter, 1985), and more specifically within and between hierarchies (Dacin, Ventresca, and Beal, 1999; Burt, 2000) such as in the cases of matrix structures (Greiner, 1972), strategic alliances, commodity chains (Gereffi, 1994), and transnational hierarchies (Scott, 1999). Relational networks are also embedded in culture, as in the cases of the relative immunity of relational network forms of organization to acquisition under personal capitalism, but not under market capitalism (Thornton, 2001).

Relational networks are also characterized as governance structures, and in this respect economists and sociologists disagree. From a sociological perspective, Powell (1990: 307) argues that relational networks are distinct governance structures in that they embody in their organizational form unique “logics.” The logics associated with network forms of organization serve as governance mechanisms for economic, social, and political exchanges, acting as an alternative to the control mechanisms of markets and formal hierarchies. Relational networks control and dampen the negative effects of market competition because they embody the logics of trust, reciprocity, and cooperation. Williamson (1991) argues the economic view – networks are motivated by lower transaction costs, not by a distinct culture of cooperation. They are “hybrid” forms located on a continuum between markets and hierarchies.

Dore (1983) found that a “spirit of goodwill” explained the network relationships between Japanese buyers and suppliers. Uzzi (1996) demonstrated how



the “logics” of networks moderate opportunism in U.S. garment manufacturing. Thornton (2002) showed that the “institutional logics” of personal capitalism explained and fostered the prevalence of relational network structures and suppressed the development of formal hierarchy. Gulati and Gargiulo (1999) found that relational networks arise from prior embeddedness and repeat ties, motivated by lowering search costs and the risk of opportunism.

Relational networks are also a method of analysis that is compatible with economic and organization theories useful to explaining entrepreneurship. From an economic transaction cost perspective, networks are thought to be less costly and a more efficient alternative to formal hierarchy when innovation is autonomous and there is not a “small numbers” problem in the supplier markets (Chesbrough and Teece 1996). From an institutional perspective, networks are carriers of institutions that shape the identities and behaviors of entrepreneurs and organizations (Scott, 1995: 52–54; Thornton, 2002). From a social capital perspective, networks, that is their level of status and legitimacy, affect a number of entrepreneurial processes, such as the market valuations of privately held biotechnology firms (Stuart, Hoang, and Hybels, 1999), higher-status venture capital firms signaling lower risk to investors (Podolny, 2001), and wealth creation in postsocialist Hungary (Stark, 1996). Networks can be analyzed from an organizational learning perspective in which they are conduits for collaborators to internalize one another’s skills, thereby creating new opportunities (Hamel, 1991; Kogut, 1988) and novel syntheses of information (Powell and Brantley, 1992). Networks can also be analyzed from a resource-dependence perspective – as in the case of incubator firms assisting nascent entrepreneurs in networking with other organizations to collect valuable resources (Hansen et al., 2000).

Networks also can be bounded by different political and geographical jurisdictions that may have implications for an increase or decrease in entrepreneurial activity. An example is differences in property rights laws among states that produce regional and national competitive advantages resulting in incubator regions and enterprise zones (Campbell and Lindberg, 1990). Alternatively, differences in legal institutions between nation-states, for example the European Union with its many divisions, may inhibit a culture and science of innovation. As Guillen (2001) found in his literature review, most empirical studies do not find convergence in political, social or organizational patterns as a result of globalization.

Geographies

Geographic variation in the rates of entrepreneurship has been a recurring finding in research on new firm formation (see Malecki, 1997 for a review of U.S. and international studies). Networks of actors, whether consisting of individuals, organizations, or industries, play a critical role in the formation of these regional patterns. Networks are bounded by a material resource space that varies in geographic location, density, and physical proximity. Geographies



can be theorized from each of these perspectives, raising interesting questions about how each affects the diffusion of innovation and the development of entrepreneurship. It is a given that with respect to geographical location (classical theory of regional economic development), natural resources differ from place to place, and, therefore, interregional trade encourages producers to concentrate on these given and comparative advantages.

With respect to density, agglomeration theory argues that density increases entrepreneurship because of the social construction of localized political and cultural assets such as mutual trust, tacit understandings, learning effects, specialized vocabularies, transaction-specific forms of knowledge, and performance-boosting governance structures facilitating entrepreneurship (Scott, 1999: 388). Although not working in the tradition of agglomeration theorists, Schoonhoven and Eisenhardt (1993) showed similar effects in that competition is less important than the effects of cooperation and spatial proximity, features that facilitate organizational learning. Similarly, in the industrial economic tradition, Porter (1980) argues that increases in competition at the local level increase entrepreneurship, which leads to competitive advantage among regions and nation-states at the global level. In contrast, the concept of density, the central force in population ecology theory, increases competition, which in turn suppresses the founding rate of new enterprise. In applying ecology theory in the multicountry context and to the emergence of the automobile, competition was shown to have local effects and culture (cognitive legitimacy) was shown to have global effects (Hannan, Carroll, Dundon, and Torres, 1995).

Even in the age of electronic communication, entrepreneurship is a local phenomenon in which geographic proximity and face-to-face contact in the exchange of information and technological knowledge are critically important in a number of respects. Tacit knowledge is best communicated informally and is vital to found new firms. Such knowledge rarely resides in formulae or blue prints – if it did, it wouldn't be entrepreneurship (see Brown and Eisenhardt, 1995 for a summary). Moreover, the socialization effects of learning to be an entrepreneur must to some extent involve face-to-face contact with entrepreneurs, angel investors, and venture capitalist role models in the immediate environment (Malecki, 1997). Similarly, face-to-face contact is required to obtain funding; it is necessary to present business plans and to develop and demonstrate reputational capital and the management team experience and expertise that is the basis for investment decisions when there are no physical assets to serve as collateral. Likewise, investors also seek to lower risk by hands-on relationships with entrepreneurs and their fledgling companies, and this is not possible without geographic proximity and face-to-face relationships.

Geographies also can be bounded in terms of neighborhoods and cyberspace. Because these entities are likely to be communities, their boundaries may not be material- and resource-based, but instead cognitive- and culture-based. For example, Redding's (1990) Neo-Weberian analysis of the success of Chinese businessmen abroad is based on the Confucian ethic and aspects of the Chinese family – showing that entrepreneurial minority groups in one country are



entrepreneurial in others, and evidencing how culture is not just place oriented, but can be transnational and render geographical distance and boundaries irrelevant. Even more impervious to the limits of material boundaries are cyberspace communities based around Internet etiquette, such as in the case of the development of the software product Linux, distance education programs, and less formally organized chat rooms and bulletin boards.

REVIEW OF NETWORKS AND ENTREPRENEURSHIP

The study of networks and their impact on economic transactions stems back to classic literatures in economics and sociology in which social and relational structure influence market processes (Veblen, 1972; Granovetter, 1985). Malecki (1997) argues that entrepreneurial environments exhibit thriving and supportive networks that provide the institutional fabric linking individual entrepreneurs to organized sources of learning and resources. The quantitative research on networks and entrepreneurship has largely concentrated on three different levels of analysis – network ties between individuals, those connecting teams and groups, and those connecting firms and industries.

Individuals

Research indicates that there is a relationship between the structure of a network and the processes inherent in the discovery and exploitation of entrepreneurial opportunities. According to Burt (1992), individual entrepreneurs with deep “structural holes” in their networks – that is, an absence of contact redundancy and substitution – increase their chances of successfully identifying and exploiting entrepreneurial opportunities because they are central to and well-positioned to manipulate a structure that is more likely to produce higher levels of information. Burt (1992) argues further that network structure can help the information process by allowing individuals to evaluate those they do not know through the opinions of those they do know. Burt (2000) provides a comprehensive review of this rapidly growing research literature on networks and social capital.

Shane and Cable (1999) show contrary to structural hole theory, entrepreneurs with networks high in cohesion drive financial investment decisions. Using survey and interview methods, they examined the impact of social networks, referrals, reputation, and direct ties on the likelihood of investment in early stage new ventures. Though companies looking for financing have an upper hand in making deals because they possess more information than do potential investors, investors do not remedy this informational imbalance by entering into stringent contracts. Rather, they invest in companies with whom they have social relations. Additionally, Shane and Cable found that an investor will not invest in an entrepreneur who is unknown in the investor’s network, not referred by someone the investor respects, not highly regarded among



investors, or not directly connected to the investor, unless the technology of the new company is outstanding. The interconnections between investors and the connections between investors and target firms are highly influential in helping investors select target companies.

Abell (1996) also examines the impact of structural-level determinants on individuals' opportunities for entrepreneurship. At a more macro level of analysis, using the Labor Force Survey in Great Britain he examines those entering self-employed entrepreneurship. The Gross Domestic Product, unemployment rates, and previous rates of entry to and exit from entrepreneurship have consistently positive effects upon current rates. Abell argues that past rates affect current rates because if rates of entrepreneurship have been high in the past, current potential entrepreneurs are likely to know someone who is, or has been, an entrepreneur, and who can recommend entrepreneurship as a legitimate career option.

Other relational network structures provide socialization experiences which affect individuals' ability to discover entrepreneurial opportunities and to collect the resources to found new firms, such as "mentor-capitalists," angels, and headhunters. Leonard and Swap (2000), using interviews and field methods to develop a case study, explored a phenomenon that arose in Silicon Valley – mentor capitalists. They describe how entrepreneurs receive entrepreneurial training from mentor capitalists who also use their social capital networks to attract human and (follow-on finance) capital for the entrepreneurs of new ventures.

"Bands of angels" are another important source of social capital that provides informal seed capital to entrepreneurs.¹ Angels are wealthy individuals who informally come together in groups to provide early or mid-stage financing to new ventures. Each angel financially contributes to a pool of funds and the angels then meet as a group to decide which ventures to fund. Angels also advise the companies they fund and create connections between them and experts in the field or other, more experienced companies which also may be able to help the nascent companies with management advice or later-stage funding. Bands of angels are important members of the ecosystem of resources available to nascent entrepreneurs. Angels have symbiotic relationships that form networks in the financial community, serving as referral agents and co-investors with both venture and corporate capitalists.

Finlay and Coverdill (2000) describe headhunters as individuals who are "network builders" – they have a significant impact on helping entrepreneurs develop new ventures. Using interviews, fieldwork, and surveys, they show how headhunters and their ties can help companies find the managers needed to run new ventures. The management team is one of the key assets in a new venture, and if the individual members of the team are well-qualified and have a track record they signal a higher potential for value creation and less risk to

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potential investors. The search to increase value and lower risk has given increasing importance to the formal organization of headhunters.

Teams and Groups

Founders can pursue strategies individually, however collaboration with other founders and members of the management team is essential (Aldrich and Martinez in this volume; Cooper and Daily 1997). Different types of team experience have been found to predict entrepreneurial success. Roure and Maidique (1986) found that in team-based new companies the breadth of experience that a team had in different functional areas was a major predictor of success in the venture. Higgins and Gulati (2001) theorize that the network ties of the management team to previous employers are determinants of success because they help potential evaluators judge the quality of a nascent firm. In analyzing the 5-year employment experience of more than 3000 executives who were among the top managers of biotechnology firms founded between 1961 and 1994 in the United States, they found that having a management team with experience in companies located downstream, some kinds of upstream companies, and having a management team with a range of experiences predicts success in obtaining financing and public offerings. Higgins and Gulati (2001) also found that the previous employment experience of the entire management team, and not just the CEO or top managers, matters, and that a company's financial success is not mediated by the prestige of its lead bank. In sum, a variety of different types of team experiences were found to predict entrepreneurial success. Birley and Stockley (2000) provide a literature review on entrepreneurial teams and entrepreneurial success.

Firms

Firms as a focal source of entrepreneurship is understudied (Acs and Audresch, 1988) – whether it is in the context of a formal hierarchy, an incubator or venture capital-backed firm, or the result of developing new capabilities by acquisition and joint venture activities (Mitchell and Karim, 2000). While the number of start-ups by means of bootstrapping and family capital may be greater, it is arguable that the more formally organized contexts for founding new ventures are more likely to produce larger firms and higher returns.

In an early case study of the semiconductor industry, Freeman (1986) argues that entrepreneurship depends upon firms – venture capital and others – and upon the relations between them. High-technology firms tend to be started by employees from larger organizations who leave these organizations to found new firms when the environmental conditions are favorable. In a network sense, the number of venture capital sources and the relations among them create an environment in which people in large organizations wish to leave their firms, connect themselves to the venture capitalists, and found new high-technology firms. Freeman (1986: 49) argues that the process culminates in the



creation of new high-technology firms; his argument works equally well in explaining the foundings of venture capital firms.

Phillips (2001) quantitatively tests Freeman's (1986) proposition that firms create entrepreneurship by spinning-off new firms. In a population-level study, Phillips shows with Silicon Valley law firms that new organizations are often founded by members of older organizations within the same population – what he terms the “parent-progeny transfer.” He argues that the transfer of routines and resources between a parent organization and its progeny is a function of the employment relationship and career history between the parent firm and the potential founder. Phillips further shows that the higher the previous status of the new founder in his or her former firm, the higher the failure rate of the parent firm and the lower the failure rate of the progeny.

Suchman, Steward, and Westfall (2001) describe how professional services are codified to help entrepreneurs structure their firms according to legal conventions within the venture community. In a case study they show the role of Silicon Valley law firms in standardizing practices in the entrepreneurial community and how entrepreneurship depends as much on convention as on innovation. Local law firms act as dealmakers, counselors, and proselytizers in the routinization of “cookie cutter” organizational forms from which the entrepreneur can select. In their portrayal, the entrepreneur learns the most efficient way to start a firm, thus economizing on entrepreneurial attention (Gifford, 1998) that can in turn be used for the many critical nonroutine decisions that innovating entrepreneurs must make in order to obtain resources and legitimacy (Aldrich and Martinez in this volume).

Although intrapreneurial corporations have a long history of founding new ventures (Block and Macmillan, 1995), most of what we know about the effects of intrapreneurial contexts for founding is based on descriptive case studies that are often flawed by sampling on the dependent variable. Overall, the case study evidence indicates no differences in new ventures funded with corporate as compared to venture capital. The one large sample study by Gompers and Lerner (2000) discovered that firms founded with corporate capital that have a focused “strategic fit” show outcomes comparable to or better than those firms funded with independent venture capital. In particular, they found that firms ventured by corporate capital have the same likelihood of going public as those ventured by independent funds. They further found that, though corporate capitalists make investments at a premium, this premium is not inflated in investments where there is a close fit between corporate strategy and the funded company. Finally, firms capitalized by corporate sources overall were found to be less stable and have shorter life spans than those funded by venture capital. However, corporately funded ventures with a specific focus are as or more stable than firms funded by independent venture capital (Gompers and Lerner, 2000: 119–120).

These results suggest that what really matters in the outcomes of ventured companies is not whether the venture capital is corporate or independent, but how the venture capital source is tied to the firm it is funding. Corporate



venture capital funds that have a strong fit with the companies they venture, and are thus able to engage in productive networks and relationships with them, produce outcomes superior to those produced by independent venture capital funds. However, aside from the “complementarities hypothesis,” this study points to the lack of a theory explaining why corporate hierarchies may or may not be a superior founding context to that of the markets.

Venture capital firms often decide to review plans and make funding decisions on the basis of well-established referral networks – their social capital (Florida and Kenney, 1988). The recent dot.com market cycle has drawn attention to the potential biases of their decision making processes. For example, as Shaver (in this volume) points out, with the combination of the effects of the availability heuristic and illusory correlation, venture capitalists became overconfident. This created for some a legitimacy crisis in raising future funds in a down-market environment. Some venture capitalists have responded to this problem by developing practices to keep track of deals screened out by their traditional network referral system, although the VCs may not be consciously aware of their cognitive biases of overconfidence. The network-elite context of decision making by venture capitalists motivates the need to study their decision environments, and as Shaver points out, the social science to do so is well-developed.

Incubator firms typically provide a new venture with office space, expertise, network connections, and seed funding in return for equity stakes in the new ventures. The management teams of incubated companies can help one another through the similar problems they all experience; they also can receive training and connections to outside funding from incubator employees. Moreover, incubator firms help to recruit the most talented employees for their new ventures because in theory location in an incubator enhances reputation and reduces the risks and liabilities of new ventures. The overall argument for incubators is that new ventures that enter incubators are paying an equity share to gain access to networks that will enhance their chances at successful entrepreneurship. Although many incubators have gone out of business in the recent down market cycle, there were an estimated 700 incubator firms in North America in the year 2000 (d’Arbeloff, 2000: 9; Hanson, Nohria, and Berger, 2000). Eshun (2002) describes the historical origins of incubators in the U.S. and how they lower market entry barriers for entrepreneurs. Jang and Rhee (2002) documented the existence of 259 incubators in Korea alone. Sampling 123 of the relatively mature incubators that had experienced one cycle of hatching, Jang and Rhee found the diversity and quality of support services, the employment of full time staff, and the efficacy of networking distinguished those incubators with better performance.

Podolny (1993) questions whether firms should structure their networks to be rich in structural holes or to have cohesion around high-status-players. The idea is that network expansion and exclusion are countervailing principles in determining whether firms have an advantage in discovering and exploiting entrepreneurial opportunities. According to Podolny (2001: 58–59), a focus on



structural holes or on status provides a firm two different ways in which it may represent its assets and thereby address different types of market uncertainty.

In a population of firms that made venture capital investments, Podolny showed that a network rich in structural holes is more helpful in resolving egocentric (producer) uncertainty, whereas a network rich in status is more helpful in overcoming altercentric (consumer) uncertainty. Podolny's research identifies some of the contingent effects of social capital from the perspective of whether networks should be conduits for information, that is act as "pipes," or whether networks should serve to "split out" information for evaluation, that is, act as "prisms." The implications of Podolny's theory and research are that there is a tradeoff between the formation of network ties that add structural holes to the network and ties that will augment the actor's status and ability to evaluate actors in the market. Status-based views of social capital have been applied in other research on the exploitation of entrepreneurial opportunities at the stage of exiting investment from venture capital portfolios (Stuart et al., 1999).

Industries

The characteristics of networks have implications for innovation at the industry level of analysis. Powell, Koput, and Smith-Doer (1996) claim that when the knowledge of an industry is broadly distributed and rapidly changing, the locus of innovation will be found in interorganizational networks rather than in individual firms. They find a liability of unconnectedness in which strong-performing biotechnology firms have larger, more diverse alliance networks than do weak-performing firms. Smith and Powell (2002) examine the consequences of geographically bounded social networks on innovation as measured by patenting by biotechnology firms. They find that a diverse portfolio of partners aids firm patenting in physically dispersed networks, but hinders it in a regionally bounded innovation network. Acs et al. (2001) found that the use of patent data is a reliable proxy measure of innovative activity at the regional level. Audretsch and Feldman (1996) show that spillovers are more pervasive in knowledge industries than in non-knowledge industries. Similarly, Anselin et al. (2000) found that university spillovers are specific to certain industries such as electronics and instruments. Moving up another level of analysis, Acs and Armington (2002) examine the impact of interindustry networks as a source of knowledge spillovers and entrepreneurial activity, proposing a model in which local economic growth is dependent on the various information networks present in the regional knowledge base. Combined, these findings have implications for making regional geographies and the network relationships among them the central units of interaction in economies. In the subsequent sections, we highlight literatures that focus on such implications.



QUESTIONS FOR FURTHER RESEARCH

One question relevant to supply- and demand-side perspectives and issues in institutional theory is the degree to which individuals actively versus passively build the networks they access in entrepreneurial undertakings. Staber and Aldrich (1995) found that entrepreneurs maintained old network ties with individuals they knew before they began their businesses rather than strategically constructing new networks, as implied by Burt (1992). At the firm level of analysis, Gulati and Gargiulo (1999) found that networks originate from previous alliances between firms, since one of the central questions with networks is finding a trusted contact. Could the tendency to use existing networks be a case in which norms and understandings of entrepreneurship as possible and desirable simply drift across pre-existing networks? Or, is it a case, as other researchers (Lin et al., 2001) might suggest, that individuals can be much more directed in constructing social networks? Research is needed on how different kinds of networks lead to success with respect to various elements of the entrepreneurial process (Staber and Aldrich 1995).

While Burt (1992) was the first to link the concepts of network structure and entrepreneurship in his prominent theory of structural holes, scholars have been unable to agree on theories of how network structures affect innovation and entrepreneurship. Should networks be densely interconnected (Coleman, 1988) or rich in structural holes (Burt, 1992)? Do networks rich in structural holes better lead to the discovery of opportunities and networks rich in cohesion better lead to the exploitation of opportunities (Shane and Cable, 2002)? How do networks of personal relations get converted into social capital (Saks, 2002)? Moreover, how does the availability and restricted access to networks in the entrepreneurial process compromise the decision making of entrepreneurs and investors?

Ahuja (2000) finds that a network rich in structural holes is not as effective a network for producing innovations, as is the case when a firm has a large network of indirect ties. On the surface this seems to contradict the general findings of Shane and Cable (2001). The array of findings is difficult to make sense of as the research contexts and levels of analysis vary significantly. Hence, meta-analytic and large sample research is needed that lends clarity to what we know at this point about the contingent value of social capital for entrepreneurship.

One question that is of particular importance with respect to economic policy issues is whether social capital, or the gains received from social networks, are the same for all groups, and whether or not individuals and groups use networks for entrepreneurial gains in the same or in different ways. Preliminary work along these lines has found that social capital does not operate in the same ways for women and minorities as it does for white men (Burt, 1998; Burt, 2000). Extending this line of work on the inequality among groups of potential entrepreneurs is warranted, since women start more businesses than men but have less access to venture capital and other resources.



These questions need to be investigated within and across the various contexts that are rich in entrepreneurial opportunities and that present competing alternatives from which entrepreneurs collect resources. What are the specific social psychological factors that determine why women, for example might have less social capital with venture capitalists than they might with administrators of publicly-funded incubators (Shaver in this volume)?

In addition to socio-demographic differences, another way to understand differences in how individuals access networks and engage in entrepreneurship is to examine differences in systems of belief – culture. The paper by Aldrich and Martinez (in this volume) provides recent evidence that the rates of entrepreneurship continue to vary widely across nations. While McGrath et al. (1992) show that entrepreneurs have a persistent and characteristic value orientation irrespective of their base culture (nation state), their methods may not have provided adequate variation in the countries that were sampled to show an effect. For example, according to theory (Jepperson, 2002), if France were included in the sample, cultural differences may have been derived. It should not be overlooked that classic studies, considered politically incorrect today, did find cultural differences in levels of individualism and economic development when categorizing culture by religious differences at the family and country levels of analyses, respectively (Winterbottom, 1958; McClelland, 1961). At the same time the McGrath finding is supportive of recent work in sociology on the profusion of individual roles and identities in the postwar period (Frank and Meyer, 2002: 87). This research argues that increasingly society is culturally rooted in the natural, historical, and spiritual worlds through the individual, not corporate entities or groups. The findings on culture are contradictory, suggesting the need for a meta-analytic and multidisciplinary review of this research as well as the development of fresh approaches.

There is much to be done to theorize and operationalize the “carriers of culture.” As Davis and Greve (1997) have elegantly shown, networks themselves don’t spread entrepreneurial practices unless they are supported by a legitimate cultural account. Network embeddedness and power approaches by themselves don’t lend much of an explanation of why – what are the cultural mechanisms that produce learning, adoption, and diffusion (DiMaggio, 1992; Fligstein, 2001; Stinchcombe, 2002). However, relational networks as governance structures with their distinct cultural logics may be one way to examine carriers of entrepreneurial culture (Powell, 1990; Thornton, 2002). How else might the effects of culture on entrepreneurship be examined?

We discuss three approaches that might be fruitfully applied to the study of entrepreneurship, institutional logics (Freidland and Alford, 1991; Scott and Meyer, 1994), institutional differentiation (Jepperson, 2002), and organizational culture (Martin, 1992). Scott and Meyer’s (1994) research on structural influences on the identities of individuals and organizations argues that those institutional sectors that are most influential are those that have formal organizations with high status and legitimacy. They provide the salient sources of values, norms, language, advice, and occupational identities likely to influence



actors to learn to be entrepreneurial. This idea stems back to Weber's (1904) classic statement on the origin of the "entrepreneurial spirit," however it substitutes the influences of the religious sector for those of the modern corporate and market sectors (Friedland and Alford, 1991). Applying this view generates the proposition that the individuals and organizations more likely to adopt entrepreneurial identities and to discover and exploit entrepreneurial opportunities are those that are structurally situated in environments that are higher in status and richer than others in entrepreneurial ideas and resources.

This neoinstitutional perspective holds promise for explaining the origin of entrepreneurial culture in determining regional advantage. Note, it is cognitive argument and may provide analytic leverage in discussing geographies because it is not place dependent (DiMaggio, 1994, 1997); hence it may be a useful avenue to explore questions on the transgeographical diffusion of entrepreneurship (Redding, 1990; Strang and Meyer, 1994). In a related vein, Jepperson's (2002) typology on institutional differentiation captures the institutional logics and political cultures of the Anglo, Nordic, Germanic, and French "orbits." Such a typology could be used as a conceptual framework to examine potential contrasts in country cultural differences in rates of entrepreneurship. Researchers interested in cultural effects are also usually attuned to the role of symbols. We are not aware of work on the symbolic aspects of entrepreneurship. A potential new application of symbolic management (Zajac and Westphal, 2001) to entrepreneurship may become available for study with the recent emergence of social entrepreneurship programs in corporate settings.

Further research is needed to examine how professional groups that have different normative beliefs influence the rates of entrepreneurship (Audretsch and Stephan, 1996). One such setting is U.S. universities that aspire to be players in the commercialization of technologies by creating incentives and socialization experiences to turn their scientists into entrepreneurs and to create a culture of entrepreneurship. In some sectors of the university, such as professional schools, peer group norms may support entrepreneurial activities; in other sectors of the university for-profit science is held in disdain. Universities are organizations located at the center of entrepreneurial networks and geographies, and as such produce spillovers of innovations from ongoing research (Acs et al., 1994). A better understanding is needed of the interplay between faculty peer group norms and university incentives for scientists to learn to be entrepreneurs. The "contested terrain" of university entrepreneurship is an apt setting to apply classic concepts such as organizational culture (Martin, 1992), goal displacement (Selznick, 1957), and loose coupling (Meyer and Rowan, 1977) in examining how scientists may be converted to alternative contested pathways to university eminence – either scholarship or entrepreneurship.

Our review and discussion assumes that networks lead to learning and to novel syntheses of information and innovation. However, as Podolny and Page (1998) point out, this assumption has not been empirically tested. To do so we would need to know whether firms' inventions were significant departures from past inventions, and whether firms' inventions were qualitatively different from



their network ties' past inventions. There also is a lack of solid comparative evidence to support the claim that network structures are more efficient than other forms of organizing located in the contexts of markets and hierarchies (Podolny and Page, 1998). Addressing this question is important in light of understanding the best contexts for entrepreneurs to gain access to resources and to learn the ropes of entrepreneurial processes. Evidence suggests that overly embedded firms decrease their survival prospects in a sample of small, privately owned garment manufacturers (Uzzi, 1996). Building on this work, an important question is whether the same result would hold in a population of small and large firms (Aldrich, 1999) in which resource dependencies may hold different meanings and consequences (Thornton, 2001).

Research on networks in relation to management teams, the key asset of new venture formation, is under developed, but promises to produce interesting policy and scholarly payoff. For example, anecdotal evidence stemming from public policy groups, such as the Councils for Entrepreneurial Development and the National Commission on Entrepreneurship, indicates that the quality of management teams is not evenly distributed across incubator regions or more generally in the economy. Moreover, some incubator regions are resource-dependent in the sense that they can spawn significant innovations from their universities, but cannot create the firms needed to develop those innovations. For example, some incubator regions lack the level of management talent and human capital needed to develop the rate of innovations from their nearby, world-class universities. Under such conditions, local innovations can be creamed-off by other firm-rich regions such as Silicon Valley, creating a resource-dependent "third-world country" effect among incubator regions.

It may be that this disparity in management team resources explains why some incubator regions do better than others in terms of having the ability to grow large firms – and hence in the centralization and accumulation of wealth. Management teams are groups of individuals that are both trainable and mobile – they are the human capital of incubator regions. As Florida (2000) argues, regions are now in the position of having to "compete in the age of talent." Given Freeman's (1996) argument that firms are an important mechanism to create, train, and spin-off entrepreneurs, then in incubator regions without large firms, who will train entrepreneurs? Moreover, how will new ventures recruit management teams in regions where the local norms of the venture capital business support the practice of "flipping deals" rather than encouraging the organic growth of firms?

Future research also should build on status-based arguments (Podolny, 1993, 2001) by applying them to an earlier stage of the entrepreneurial process in order to better understand how individuals and firms discover entrepreneurial opportunities – augmenting the Austrian school of theorizing (Shane, 2000). The concept of status also could be applied to more macro levels of analysis and to testing in different cultural contexts. Venture capitalists are especially attuned to the importance of status in lowering the risks of investing in intangible assets. Given this, it would be fruitful to follow the trend in the



practitioner community for cross-national syndication to examine if status effects may be culturally contingent.

An important question is how new firms that emerge from within-firm networks may differ from those that emerge from outside of pre-existing firms. More generally, Thornton (1999: 38–39) raised the question of which context is most effective for the founding of firms – markets or hierarchies. In a review of the literature on entrepreneurship, Shane and Venkataraman (2000) argue that whether new ventures are developed within pre-existing firms or new firms are created expressly to pursue such ventures depends upon the type of environment and the opportunity in question. It could be that ventures formed within a pre-existing firm have an edge in that hierarchical networks have an advantage in more quickly and easily transmitting information and fostering the learning of entrepreneurship (Burt, 2000; Teece, 1999). On the other hand, it may be that networks within firms do not provide enough incentive for innovation to be realized, so entrepreneurship is not fostered as much in networks within firms as in markets. It could also be the alternative case that hierarchical systems limit in certain ways the transfer of routines and knowledge between subunits of the system (Ocasio and Thornton, 2002). Some of these ideas date back to empirical observations from classic case studies (Frankel, 1955), but beg for theoretically motivated inquiry using large sample research methods.

The controversies that surround incubators generate a number of questions for future research. Given their observed failure rate since the rise of the dot.com phenomenon, is the incubator concept as a viable economic and organizational form flawed? How do incubators differentiate themselves from competing organizational forms with proven track records, such as venture capital firms, and more informal arrangements, such as bands of angels? What is their performance record? Who are the stakeholders? Venture capitalists, for example, argue that the success or failure of a new company comes down to the people, but do incubators attract the real entrepreneur? Are experienced entrepreneurs attracted to and funded by venture capitalists and only inexperienced entrepreneurs attracted to incubators? Given these arguments, will incubators be counterproductive in giving entrepreneurs a false and sheltered sense of success? Last, the international prevalence and the astonishing rise of incubators stimulate theoretical questions that beg for large sample research on the role of organizations and the state in attempting to “level the playing field” for entrepreneurs (Eshun, 2002).

REVIEW OF GEOGRAPHIES AND ENTREPRENEURSHIP

There is abundant theoretical and empirical literature suggesting that geography may significantly impact rates and patterns of entrepreneurship. Krugman ([1991] 2000) argues that an understanding of geography is essential to a well-developed economic perspective. Howells (1996: 18) argues that, “geographical distance, accessibility, agglomeration, and the presence of externalities provide



a powerful influence on knowledge flows, learning, and innovation” (cited in Asheim and Cooke, 1998: 200). Acs and Armington (2002) suggest that theories of entrepreneurship should examine regions as the unit of analysis to understand how knowledge spillovers operate. We review work on geography and the clustering of firms, venture capitalists and their role in the entrepreneurial process, and the “ideal” type of geography for fostering entrepreneurship.

Geographical Clustering and Entrepreneurship

Cooper and Folta (2000) define clusters as groups of similar companies who may interact with one another and draw from the same resource pool. Clustering occurs around the world, in both low-tech and high-tech fields. They further describe the inequality among regions, calling attention to certain geographical regions that are especially rich in entrepreneurship. There are a number of explanations for why and where clustering occurs.

Krugman ([1991] 2000: 5) points out that individuals, firms, and industries are concentrated in particular regions of the United States. Such clustering tends to remain true over long periods of time. He discredits equilibrium-based explanations in explaining why firms are not evenly distributed across space. Alternately, Krugman replaces this traditional economic argument with another, costs and benefits, which he argues leads to industrial clustering. He argues that the reason such clustering occurs is that it is expensive to produce items across large tracts of space, and economies of scale, or benefits, can be realized by locating where other firms which supply, buy from, or even compete with, a given firm are located.

Acs et al. (1999) and Anselin et al. (2000) illustrate that research universities play a key role in the formation of clustering. Acs et al. (1999) argue that two related hypotheses explain the development of high-technology clusters in the vicinity of major university R&D activity. First, university research is a source of knowledge and innovation which diffuses through personal contacts to adjacent firms usually located in science parks. The second highlights the role of the university in producing human capital such as science and engineering graduates. Their analysis shows that academic research produces a positive, local, high-technology employment spillover at the city level. This indicates that personal contact and face-to-face communication are important mechanisms in explaining the transfer and clustering of scientific innovation into jobs and products.

Feldman (1993) argues that firms cluster to mitigate the uncertainty of innovation: proximity enhances the ability of firms to exchange ideas, discuss solutions to problems, and be cognizant of other important information, hence reducing uncertainty for firms that work in new fields. Feldman (1993) further argues that firms producing innovations tend to locate in areas where there are necessary resources and that resources accumulate due to a region’s past success with innovations. Analyzing data from the Small Business Administration, she shows how innovations in several different industries are



highly concentrated in particular states within the United States. Following Feldman's (1993) ideas, new computer hardware firms, for example, are expected to locate in areas where old computer hardware firms, suppliers, and universities with good departments of computer science, electrical engineering, and mechanical engineering are located.

Other authors writing about geographic clusters, however, implicitly or explicitly challenge agglomeration theory – arguing that it is too simple an explanation for the geographic clustering that can be observed in many industries. Some argue that resource-rich clusters do not always benefit firms. Others argue that resources develop later in a cluster's lifecycle, and thus cannot be the only reason that early entrepreneurial ventures locate in a given cluster.

Sorenson and Audia (2000) show that shoe producers in the U.S. were highly concentrated in a few regions in 1940, and essentially remained so over the next fifty years. They argue that this pattern occurred because many of the resources and inputs new shoe firms need, such as know-how and networks, come from firms already producing shoes. They argue that locations of current shoe producers play a large role in determining locations of new shoe producers, thus creating clusters that tend to sustain themselves over time. Though new shoe producers receive needed inputs from pre-existing shoe manufacturers in clusters, the picture Sorenson and Audia paint is not entirely perfect. Shoe manufacturers who opted to locate in places where there were already many shoe producers failed more often than those who located in places where the concentration of shoe producers was lower (Sorenson and Audia, 2000: 440). They present a revised version of agglomeration theory – forms tend to cluster geographically not because economic resources are locally clustered. In fact, shoe firms suffered increased mortality from clustering. In sum, Sorenson and Audia (2000) argue that clustering occurs because more social-type resources, such as know-how, are locally clustered. It remains to be seen whether their arguments will hold in the contemporary context of offshore manufacturing.

Feldman (2001) and Feldman and Francis (2001) elaborate on the agglomeration argument of Feldman (1993) by explaining the early part of cluster formation, the period before many resources are available in a given region. Using previous work on entrepreneurship and interviews with entrepreneurs to explore the development of an Internet and biotechnology cluster around Washington, D.C., Feldman (2001) and Feldman and Francis (2001) argue that clusters form not because resources are initially located in a particular region, but rather through the work of entrepreneurs. Early entrepreneurs locate their businesses in a region and adapt to the particularities of the location. As their businesses begin to thrive, resources such as money, networks, experts, and services arise in, and are attracted to, the region. With this infrastructure in place, more entrepreneurial ventures locate and thrive in the region, which ultimately may create a thriving cluster where none previously existed.



Stuart and Sorenson (1999) found that clustering occurs in the biotechnology industry and benefits firms at different lifecycle stages. Clustering occurs because ties between entrepreneurs and those who control the resources necessary to an entrepreneur's new venture tend to be geographically concentrated. From 1978 to 1996, Stuart and Sorenson (1999) analyzed the impact of proximity to certain types of resources on the likelihood of a region gaining another biotechnology company after the first one was established in the region. The resources explored are developers of the technology used, competitors and other firms in the industry, venture capitalists, and technical experts. Stuart and Sorenson (1999) found that when the effects of the four resource types are modeled separately, each resource has a significant, positive effect on the biotechnology firm founding rate in the area. When the effects of all four types of resources are modeled together, however, only the effects of having other, similar firms in the area remain positive and significant. They find that this effect declines because there are more biotechnology firms across the nation, i.e., as the biotechnology industry ages. In terms of new biotechnology firm success, when all four resource location measures are modeled separately, only the developer measure has a positive and significant effect on time to IPO. When the four resource types are modeled together, however, competitor firms and venture capitalists have a significantly negative effect on time to IPO, while developers retain their positive, significant effect on the IPO rates of nearby firms. Thus, Stuart and Sorenson (1999) show that resources such as expertise and money lead new firms to be founded in certain areas and contribute to the success of new firms in the biotechnology industry. However, their findings also show that the resources that lead to new firm foundings are not the same ones that lead a new firm to thrive. They create a model to predict the locations most likely to spawn a new biotechnology firm, and to have a new firm succeed. The model shows that San Diego and South San Francisco are the most likely to have a new biotechnology firm founded, while firms have the worst chance of going public in the San Francisco Bay Area, and the best chance at the intersection of Pennsylvania, New York, and New Jersey. Stuart and Sorenson (1999) claim that this finding challenges the traditional economic explanation of clustering, agglomeration theory, which argued that similar firms are founded in particular regions because those regions were where firms of that type would be most likely to succeed. Thus, they find evidence that clustering occurs near important resources in the biotechnology industry, but complicate arguments about economic clustering by suggesting that firms may not be formed in the geographical locations that will most allow them to thrive.

Geography, Venture Capital, and Entrepreneurship

Research shows geography affects venture capital. Thompson (1989) states that venture capital is not evenly spread across space. He provides evidence that both the givers and receivers of venture capital are highly concentrated in certain areas of the United States – showing California, New York, and New



England as the major players in the giving of venture capital funds, and the West and Southwest to be major receivers of funds. Thompson (1989) shows that venture capital has diffused geographically over time – arguing that it is a complex phenomenon whose role in economic development cannot be understood using an equilibrium model predicting the equal spread of venture capital across space over time.

Sorenson and Stuart (2001) show the value of proximity in venture capital investing, exploring the determinants of venture capital investment in the United States between 1986 and 1998. Generally, they find that the likelihood of a venture capitalist investing in a given target declines with increasing geographical distance between the venture capitalist and the company. This pattern is explicable given the hands-on commitment which venture capitalists make to finding and evaluating a target, and then aiding a new company. They find several factors that can attenuate this main effect of geographical distance. Venture capital firms that are older and have more general experience in investment are more likely to invest in companies that are more distant. Age loses significance when experience is added to the model, and experience loses significance when network-type effects are added. They find that those venture capitalists who are central in the venture capital network are more likely to invest in companies which are farther away. Additionally, venture capitalists are more likely to invest in a distant company if another venture capitalist with whom they have previously invested is also investing in that company, especially if the other venture capitalist is located close to the target company. Thus both networks and experience can lead venture capitalists to invest in companies farther away geographically than their typical investments.

Ideal Geographies for Entrepreneurship

As Storey (in this volume) shows in his analysis of the question of whether governments should support programs to develop small firms, considerable differences exist in the policies of developed countries. Another area of work with policy implications focuses on ideal geographies for entrepreneurship. The ideal geographies work highlights the characteristics that make a location a fertile ground for entrepreneurial ventures – exploring locations ranging from the level of cities or regions to that of nation-states. In particular, Woolcock (1998) has argued that the subject of networks should be added to policymaking agendas for national development, theorizing that the underdeveloped nations that thrive are those that have trustworthy ties within networks and between nations.

Asheim and Cooke (1998) divide industrial regions around the world into two major types: planned and unplanned. The planned include some United States science parks, such as Research Triangle Park, as well as the scientific city of Villeneuve d'Ascq, near Lille, France, where a large number of universities, research institutes, and incubators have been created to foster technical research and inventions. Among the unplanned regions, Asheim and Cooke



(1998) include the industrial district of Emilia-Romagna in Italy, where pre-existing concentrations of tile artisans have formed a district of more technologically advanced tile makers. Though both models of technical regions have some proven success, they find flaws with each. They claim that in the unplanned regions there is little innovation, while in planned regions firms do not network very well. Given the strengths and weaknesses of each model, Asheim and Cooke (1998) then create a new model for technical regions which combines the strengths of planned and unplanned regions while eliminating the weaknesses of each. The ideal technical region for Asheim and Cooke (1998: 235) would include structures linking people and technologies, incubators to foster new businesses, universities to add expertise, and larger businesses that could work with, and buy from, small, young companies. In a region like this, one would expect to see entrepreneurship flourishing. Asheim and Cooke (1998: 235) note that this ideal model is already being realized in some Nordic countries.

Florida (2000, 2002) writes about ideal regions for high-technology development, focusing on lifestyle issues – the relationships between people and places. The rise of entrepreneurship has taken place in those areas that are rich in intellectual and cultural capital – which in turn draws human capital. Based upon quantitative and qualitative research on American technology regions and workers, including several case studies, he discusses ways for American regions to recruit high-technology industries and high-technology workers. He argues that it is not enough for a region merely to boast many technology jobs. Rather, the “creative class” is attracted to cities and regions that are generally pleasant places to live. He argues that cities and regions that wish to succeed in the high-technology economy must invest in a clean environment, a good infrastructure, and sustainable growth. High-technology businesses and workers, he argues, favor locating in areas where the environment is less polluted and the regional infrastructure is strong – perhaps boasting good transportation, top-quality universities, and an outdoor lifestyle. As Florida states (2000: 7), “Quality-of-place is the missing piece of the puzzle. To compete successfully in the age of talent, regions must make quality-of-place a central element of their economic development efforts.”

Other authors focus on geography at the level of the model state. Through the use of historical case studies, Campbell and Lindberg (1990) develop the argument that the state is an actor that makes various types of changes in property rights laws, creating new opportunities for innovation and entrepreneurship. They argue that one mechanism through which the American government has shaped the economy is its power over property rights. For political and economic reasons, the American state can – and does – change the rules about property rights. In response to these legal changes, businesses change their structures, new opportunities open up, and old ones shut down. Campbell and Lindberg (1990: 639–640) give examples of the state intervening in the economy via property rights legislation, including the de-monopolization of



the American telecommunications industry and the governmental acquisition of private railroad companies to save the railroad sector.

Evans (1995, 1996) delineates the characteristics of the model state for industrial development. For Evans (1996: 263), the ideal state would exhibit what he terms "*embedded autonomy*." Such a state would be strong internally and connected to private outside resources. Such a state, argues Evans (1996), existed in Korea, and was able to bring the national technology industry to the forefront of the international economy in the 1970s and 1980s. According to Evans (1996), other states, for example, India and Brazil, lacked either the internal state cohesiveness or the external connections to make their technology sectors as internationally competitive as those of Korea. Though the embeddedly autonomous state sounds like a perfect model for development, Evans (1996) notes that when strong states combine with private actors and actually succeed in developing technology sectors, the balance of power can swing away from the state, even though the state, perhaps in a somewhat different form, may still be necessary for the new technology sector to survive and thrive. Evans (1996: 275–277) argues that this moving of the power away from the state is what happened in Korea, and it ultimately hurt the technology sector. Applying Evans' (1996) line of reasoning, then, entrepreneurs would be best served by location in a state which is strong internally and connected externally, but flexible enough to adapt as the balance of power shifts with the creation of new markets.

Going Beyond Geography

Several authors suggest that locating in the correct geography is helpful for a new venture, but is not in and of itself sufficient to guarantee success for the new enterprise. Asheim and Cooke (1998) and Evans (1996) suggest that, within the correct location, networking must take place in order for new firms to thrive. In addition, corporate and regional culture are necessary elements for entrepreneurship to be successful in the right geography.

Saxenian (1994), in comparing the high-technology regions of California's Silicon Valley and Boston's Route 128, argues that geography contributed to the success of Silicon Valley's high-technology sector, and was aided by personal characteristics of the individuals and the differences in organizational structure and culture. In Silicon Valley, individuals with similar backgrounds came together to found technology businesses in a small area where the rules were not clearly established. They formed a culture of pioneering and entrepreneurship where everyone helped one another, regardless of firm affiliations. This communal spirit, facilitated by the network structure of firms, small geography, and employee mobility, ensured that individuals frequently encountered one another. In contrast, New England had a history of innovation and an established way of doing business which involved keeping ideas strictly within the hierarchical boundaries of the firm. Additionally, New England's Route 128 corridor was geographically larger than Silicon Valley, which may have reduced



the possibility for frequent interaction among individuals. In sum, Saxenian (1994) argues, it was the combination of people, culture, and geography that allowed Silicon Valley to surpass Route 128 in America's high-technology race.

Feldman and Desrochers (2001) echo the importance of culture to entrepreneurial success even within a promising geography. They claim that, though universities such as Stanford and the Massachusetts Institute of Technology have been central to the development of high-technology regions, universities have different cultures, some of which do not promote the kinds of activities helpful in developing a technology cluster. Feldman and Desrochers (2001) studied one Washington, D.C., area university and found that, although interesting research was conducted, the university's culture discouraged technology transfer. This culture inhibited the progress of the university until recently when it started to make small inroads in contributing to the development of local industry.

QUESTIONS FOR FURTHER RESEARCH

The research on geography and entrepreneurship reviewed above represents a wide range of theoretical perspectives on where entrepreneurship occurs and how entrepreneurial environments differ from other environments. This literature is both consistent with and challenging of classic perspectives in geography, such as regional density and proximity. Clustering remains a prevalent phenomenon around the world. Many of the questions that have traditionally confronted economists, regional developers, geographers, and sociologists in reference to economic geography remain unresolved. Traditionally, economists have argued that clustering occurs because entrepreneurs are attracted to resource-dense locations. However much of the research reviewed refutes this economic explanation of clustering, doing so in many cases with strong empirical evidence from large sample studies on populations of organizations. Future research should continue to address the conundrums of agglomeration with respect to why entrepreneurs and industries tend to cluster, but in particular should advance to questions on whether clustering enhances economic success, and why one region or cluster may have a competitive advantage over another.

Another traditional economic question that presents possibilities for future research on geography and entrepreneurship is the issue of density. Positions on the effects of density range from a high density of competing firms leading to entrepreneurship (Porter, 1980; Feldman, 1993), to density leading to the death of competing firms (Carroll and Hannan, 1992), to positions arguing that a high density of competing firms is both beneficial and detrimental (Sorenson and Audia, 2000; Stuart and Sorenson, 1999). The question thus remains to be clarified via further research: What are the effects on entrepreneurship of locating in a resource-rich or firm-dense location? Additional issues to be clarified via such research would include what sorts of density benefit firms, and what sorts might be detrimental to firms. Stuart and Sorenson (1999) show



that the lifecycle stage of a firm is an important variable intervening in how density affects the success of entrepreneurial ventures. They note that the national density of biotechnology firms attenuates the effects of local resources upon founding rates of biotechnology firms in a given local area. This suggests that the effects of locally rich resources (local density) may depend on national resource pools (national density). Moreover, the work of Smith and Powell (2002) implies that local density and the lifecycle stage of a network are related to levels of innovation in geographies.

One phenomenon whose impact cannot be ignored is the growth of the Internet. An interesting line of research could explore how this invention, and the spread of Internet access around the world, affects the interplay of geography and entrepreneurship. It has been demonstrated that entrepreneurship occurs as a result of local forces such as clustering and proximity; might the development of Web-based technologies and resources foster global effects? However, it could be counter argued that the Internet is incapable of transmitting information in the same way as person-to-person interactions (Howells, 1990; Nohria and Eccles, 1992; Feldman forthcoming), and thus is not as viable a networking resource in creating entrepreneurial ventures. While it may seem logical that the importance of geography would fade away in favor of the influence of a global Web, Sorenson and Stuart (2001) remind us that regionalism plays an important role, even in the global economy. Feldman (forthcoming) argues in a review paper that the Internet may actually increase regionalism and the power of geography in several ways. First the spread of the Internet may create a divide between those who can afford access to the infrastructure and those who cannot. Feldman further suggests that as Internet access spreads and workers can choose to live anywhere and still access the information they need, they may choose to live in desirable locations, with others similar to them, and thus the world may become even more clustered as a result of the Internet than it was before information was electronically accessible. The advent and spread of the Internet provides a fruitful arena for research into the roles that proximity and geography may play in the entrepreneurship of the next millennium.

CONCLUSION

This chapter has explored literatures on two contexts that impact various aspects of entrepreneurship: networks and geography. We have drawn upon economic and organization theories from different levels of analysis to highlight issues and questions for further research. This chapter concludes with a few final sections that discuss the possible interconnections between networks, geography, and entrepreneurship.

Networks and Entrepreneurship

The literature reviewed has shown that networks with cohesion in which trust is fostered are contexts in which information flows easily, characteristics that



are central to reducing the risk of investment in innovation. Whether networks connect individuals, groups, or firms to one another, or tie together actors from two or more of these categories, they are contexts that provide the social, financial, and human capital that fosters entrepreneurship. Research is needed that considers issues of power and status in exploring how different groups of actors construct and access their networks and purposely use networks for entrepreneurial gains, and how these differences may impact entrepreneurial outcomes. Research beyond anecdotal case studies is needed that shows how networks led to the discovery of opportunities and introduced would-be entrepreneurs to management teams and to the venture capital marketplace. Future research should examine these person-place questions with respect to identifying the supply- and demand-side and the local and global forces. For example, capital is mobile in global equities markets, however venture capital is local and less mobile because it is constrained by the relational and spatial aspects of reputational and cultural capital. When cultural capital is tied to geography, it is a demand-side or pull characteristic. When cultural capital operates at the individual-level, as in the “entrepreneurial spirit,” and is a result of cognition and socialization, it is mobile and is a supply-side or push force in the development of entrepreneurship (Redding, 1990). A better understanding of these theoretical mechanisms is needed in developing educational and policy programs in entrepreneurship.

Networks are governance structures that include a variety of organizational, as distinct from market, contexts. Research is needed that compares the outcomes of various organizational forms for commercializing certain types of innovations, such as public versus private incubators, incubators versus bands of angels, and others. More generally, this question can be asked about organization versus market contexts – both for the training and creation of entrepreneurs and for the founding of new firms. The variety of organizational alternatives for entrepreneurs to found new ventures has been increasing; they represent a continuum that varies in the degree of structural centralization, from licensing contracts to intrapreneurship in a formal hierarchy. Research on these structural alternatives has not kept pace with their development in the growth of both numbers and varieties. Hence, knowledge is limited on how such structural alternatives may be solutions to the problems that entrepreneurs face in exploiting entrepreneurial opportunities.

The incubator firm in its various incarnations is a relatively new creature on the entrepreneurial landscape and as a result it is understudied. We have only descriptive data, yet this important phenomenon presents an opportunity to explore research hypotheses at the cusp of firm and market boundaries (Williamson, 1975). Teece (1999: 146) argues specifically that research is needed on the relationship between innovation and the boundaries of firms. Moreover as an organizational form propelling the rate of entrepreneurship, incubators have grown rapidly and have witnessed a high rate of mortality with the post-dot.com market cycle. The rapid dynamics of this population of firms make it an appropriate context of analysis for a population ecology study. University



and government sponsored incubators make sense in that they provide shelter from market forces for teaching purposes to train scientists to be a part of an entrepreneurial management team, to commercialize technologies that do not have self-evident market applications, and to develop technologies with huge start-up costs. However, the publicly owned, profit-making variant of the incubator firm is an economic anomaly because one could argue that it should attract inexperienced entrepreneurs and hence raise, rather than lower, the learning curve. Research needs to address whether its incentive structure and set of stakeholders may not be competitive with corporate or venture capital alternatives.

Geography and Entrepreneurship

The work on geography and entrepreneurship has demonstrated that geographical concentrations are found in many industries and in nations around the world. Geographical proximity and geographical clustering provide the resources necessary to the flourishing of entrepreneurial ventures including knowledge, services, and money. Furthermore, some geographies have been theorized or found to be more conducive to entrepreneurship than others.

Despite the work on geography and entrepreneurship, work remains to be done, especially on some of the basic questions about clustering and the impact of the Internet on geography. Agglomeration has been the traditional economic explanation of geographical clustering. Though much of the work presented here has refuted the agglomeration explanation, a new theory for geographical clustering remains to be found. Similarly, the positive and negative effects of density, another concept popular in explanations of industrial clustering from both economic and sociological perspectives, needs to be researched to adjudicate the inconsistencies and define the contingencies. Finally, the Internet and its spread across the world may have far-reaching effects on entrepreneurship. Whether, and how, the Internet affects the geography of entrepreneurship will be a question of the utmost importance for scholars of entrepreneurship in the coming years.

Putting it All Together: Networks, Geography, and Entrepreneurship

We have reviewed the literatures on networks and entrepreneurship in separate sections from those on geography and entrepreneurship. However, this distinction is an analytical one, not an actual one, as these differences are not likely to be clear-cut. It may be that geographical proximity leads to networking, which aids in entrepreneurial ventures. This certainly seems to be the idea behind Saxenian's (1994) argument on the advantages that catapulted Silicon Valley ahead of Route 128 in America's high-technology sector. In a theoretical piece, Johannisson (2000: 380) implies that geographical clusters of industry lead to networking, and the combination of physical closeness and networking can lead to entrepreneurial ventures. On the other hand, it could be that



networking leads to geographical closeness. Shane and Cable (1999: 35–36) suggest that the connections between entrepreneurs and venture capitalists which make financing easier to obtain may lead entrepreneurs to locate to, or stay in, regions where venture capitalists are located, thus leading to geographical concentration. One classic theorist, Macaulay (1963), argued that close connections to other people tend to be located within a close geographic distance of the individual actor. Thus, it may be that geography leads to networks, which in turn create opportunities for entrepreneurship. Conversely, it may be that networks lead to geography, which then creates spaces for entrepreneurial ventures. Networks, geography, and entrepreneurship are intertwined in complex ways which are difficult to parse and to understand, but which provide rich motivations and opportunities for future research.

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