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By

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Abstract

Existing theories of inter-organizational relationship formation imply that decision makers use referrals from current partners to form new ones, leading to dense ties that aggregate into homogenous clusters. Actual inter-organizational networks do include ties to strangers and extant explanations for their formation focus on organizational or environmental attributes. This study proposes a new explanation for the formation of inter-organizational ties to strangers by outlining how individual entrepreneurs' networking actions lead to differential use of referral based search for exchange partners for their venture. I posit that entrepreneurs use a greater proportion of referral based search when their interpersonal networking behaviors focuses less on adding new contacts and more on maintaining existing contacts. The empirical analysis employs a longitudinal design using data coded from the business cards of new contacts formed over a two-month period by a panel of 73 Indian entrepreneurs operating business-to-business ventures in a single industry sector. The key contribution of this study is to show that contrary to extant literature that stresses the importance of referrals in exchange partner selection, particular types of networking behavior enable entrepreneurs to mimic the benefits of referrals and thereby shapes how they balance referral versus direct modes of search for new exchange partners.

Key words: Entrepreneurship; Personal Networks; Networking Behaviors; Partner Selection

A core finding in the research on partner selection is that organizational decision makers often follow a uncertainty reduction logic in selecting their exchanges by engaging past partners in repeated ties or forming new ties with partners' partners based on referrals (Baker, 1990; Uzzi, 1996; Gulati and Gargiulo, 1999) rather than searching for riskier and more uncertain ties with strangers (Li and Rowley, 2002). However, research also suggests that ties to strangers can sometimes provide the focal organization benefits that could outweigh the risks and uncertainty. These benefits include connecting the focal organization to non-redundant contacts with unique information that their partners do not possess as well as opportunities to broker resource and information flows across unconnected partners (Burt, 1992; Ahuja, 2000; Rowley et al., 2000; Soda et al., 2004).

A nascent literature has provided important insights into the firm level and environmental circumstances that lead organizational decision makers to select strangers as exchange partners. Thus research demonstrates that organizational decision makers initiate partnering with strangers when there is a significant discrepancy between actual and aspirational performance of their firms (Baum et al., 2005); when firm-specific uncertainty is high (Beckman et al., 2004) or when firms participate in unusually faddish events or events where risks are minimal (Sorenson and Stuart, 2008). This stream of research however, has paid less attention to individual level variables that may help clarify the circumstances under which organizational decision makers seek referrals to secure new exchange partners as opposed to directly accessing the targeted potential exchange partners. Thus current theories of partner selection cannot adequately explain why some decision makers might use a greater proportion of referrals than others while searching for new exchange partners.

Understanding individual decision makers' attributes as a driver of search for inter-organizational exchange partners could be a particularly pressing issue in the context of new

ventures. There are two reasons why this might be the case. First, adding exchange partners is critical for survival and growth of new ventures (Venkataraman and Van de Ven, 1998; Baum et al., 2000; Hite and Hesterly, 2001). Second, during the early years of a new venture, search for exchange partners is likely to be conducted primarily by the founding entrepreneurs (Larson and Starr, 1993; Aldrich, 1999; Hallen, 2008) and entrepreneurs vary in the extent to which they use referrals from personal network contacts as a mechanism for adding new exchange partners (Baker et al., 2003). Entrepreneurs' personal network is defined as the set of individuals (alters) with whom the entrepreneur (ego) has direct inter-personal relations and the relations between alters (Aldrich and Zimmer, 1986). Searching for new exchange partners using referrals from current personal network contacts can create benefits for the entrepreneur, such as ease in gaining and sustaining targets' attention, identifying targets that are more likely to result in a successful match with the venture as well as stabilizing the potential relationship with the target. However, referral based search also imposes costs on the entrepreneur, such as increased obligations to the referee, confining search to a narrower section of the opportunity space and greater constraint in the potential relationship with the target. So, it's unclear how entrepreneurs balance these two different modes of search – referral based versus direct search. To address this gap in our understanding I explore the following question: Why do some entrepreneurs use a greater proportion of referrals than others while searching for new inter-organizational exchange partners for their venture?

Drawing on the literature on entrepreneurs' personal networks (Aldrich and Zimmer, 1986; Aldrich, 1999; Hoang and Antoncic, 2003) I use two complementary logics to answer this question. First, using a structural logic I develop a baseline prediction by outlining how structural holes (Burt, 1992) in the pre-existing social structure around entrepreneurs affect the costs and benefits of referrals and thereby drive referral based search. Second, drawing on

an agentic logic that actors can engage in reflexive choice (Emirbayer and Goodwin, 1994; Emirbayer and Mische, 1998) I examine how an entrepreneur's networking behavior affects the costs and benefits of referrals and thus influences her reliance on referral based search for exchange partners. By networking behaviors I refer to network broadening actions by which entrepreneurs add new interpersonal ties as well as network deepening actions by which they maintain existing interpersonal ties. Using this logic, I outline the conditions under which entrepreneurs substitute between referral based and direct access to potential exchange partners. I argue that entrepreneurs who engage more in broadening actions essentially mimic the benefits of referrals without incurring the attendant costs and hence are less likely to engage in referral based search. Conversely, entrepreneurs engaging in greater deepening actions are more likely to pursue referral based search because they have lower costs to referrals. Finally, since the net benefits of network deepening actions may depend on the level of network broadening actions, I examine how they interact to affect referral based search.

I tested these arguments by following a panel of 73 entrepreneurs running business to business (B2B) ventures in a single industry sector in India - the Information Technology and IT enabled services sector - over a two month period using a longitudinal research design. I first observed these entrepreneurs' personal network structure, networking behavior and other firm and individual controls. I then observed their subsequent search for inter-organizational exchange partners using data coded from the business cards of the new people they met. I enrich the quantitative analysis with open ended, exploratory interviews with an initial set of 9 entrepreneurs and semi-structured interviews with 40 of the entrepreneurs who participated in the longitudinal data collection. The initial interviews guided my conceptualization of network broadening and network deepening actions as well as helped ground variables and

measures in this empirical setting. The subsequent fieldwork enabled a rich and nuanced understanding of how the proposed mechanisms play out in this empirical context.

THEORETICAL BACKGROUND ON REFERRAL BASED SEARCH

In this section, I develop the complementary logics that cause variation in entrepreneurs' use of referrals from personal network contacts to search for new exchange partners. I begin by outlining the costs and benefits of referral based search. I then introduce the structural logic approach that outlines how these costs and benefits might vary depending on the pre-existing social structure around entrepreneurs and develop a base line prediction. I then introduce the agentic logic approach by first outlining the constructs of network broadening and network deepening actions and then laying out arguments on how costs and benefits of referral might vary depending on networking actions. The predictions on the main and interaction effects of networking actions on referral based search follow.

Costs and Benefits of Referrals from Personal Network Contacts

An entrepreneur (ego) that wants to access a targeted potential exchange partner can approach the target directly or obtain a referral from her current personal network contact (the referee) - that knows potentially relevant persons in the target firm. Searching for new inter-organizational exchange partners using referrals from the entrepreneurs' current personal network contacts provides benefits as well as imposes costs on the entrepreneur. Drawing on social exchange theory's (Emerson, 1976) quasi-economic style of reasoning, I argue the approach that minimizes costs while maximizing benefits will result in a more efficient mode of search.

<u>Costs of referral based search:</u> Using referrals to access a new exchange partner for her venture imposes three types of costs on the entrepreneur (ego) - increased obligations to the

referee, greater constraint in the potential relationship with the target and limiting the search to a narrower segment of the opportunity space. First, referrals impose costs to ego because of the norm of reciprocity that underpins social relationships. Building on Malinowski (1922)'s notion of reciprocity – balance between giving and taking in a relationship – social exchange theory suggests that a pervasive feature of interpersonal ties is the norm of reciprocity – where current favors create diffuse future obligations, which cannot be bargained about, but must be left to the discretion of the one who makes it (Blau, 1964; Emerson, 1976). The norm of reciprocity implies that using referrals to access the target would impose on the focal entrepreneur (ego) an obligation to return the favor to the referee. Even if the referral was a repayment of a past obligation to ego, there is an opportunity cost of the "credit slip" (Coleman, 1990) used up by the referral. Finally, while the focal entrepreneur could potentially free-ride and not repay obligations to the referee, reputational concerns will likely override this effect since entrepreneurs have low credibility to begin with and hence can ill-afford to free ride.

The second cost imposed by the referral is the constraint due to the formation of a triadic relationship between ego, referee and the target. From the point of view of the focal entrepreneur, the potential dyadic relationship between ego and target would be formed as a simmelian tie (Krackhardt, 1999) if the search occurs through a referral. Krackhardt (1999) identified two people as "simmelian tied" if they are tied to each other and to at least one third party in common. As outlined by Krackhardt (1999), in contrast to an isolated dyadic relationship (which would be the case if the entrepreneur accessed the target directly), simmelian ties reduce the individuality of both actors and their bargaining power. For example, when the referee is a current customer and the target is a potential new customer, the focal entrepreneur would likely be constrained in setting the prices and terms of the

economic exchange between her venture and the new customer because of the fact that the new customer is also tied to the referee.

The third key cost is the likely restriction of the opportunity space. For a given opportunity space of potential exchange partners, using referrals to search requires that the referee perceives opportunities that could be potentially useful to ego and is motivated to help ego. This is likely to be a limited portion of the opportunity space (as shown in Figure 1 of (Moran and Ghoshal, 1999)) thus preventing the formation of otherwise more beneficial exchanges for the focal venture. Put simply, referral based search might artificially restrict the potential exchange partners accessed because of referees' limitations.

Benefits of referral based search: While entrepreneurs incur the above mentioned costs in accessing new exchange partners through referrals, there are three significant benefits in using referrals – screening of a wider pool of targets, gaining the attention of decision makers in the target and stabilizing of the (potential) dyadic relationship between ego and target. First, referral based search is likely to lead to fewer blind alleys while searching for new exchange partners. This is because referees are likely to have some knowledge of the target's needs as well as the focal venture's capabilities and hence make a better match of the two during the search process.

For small entrepreneurial ventures, seeking and maintaining the attention of decision makers in target firms is problematic (Ocasio, 1997). The second key benefit of referrals is that entrepreneurs are more likely to secure an invitation from the target to pitch and the target is likely to pay more attention to the entrepreneur's initial pitch (Elsbach and Kramer, 2003) and during subsequent interactions because of referee's endorsement of the focal entrepreneur.

Finally, referrals can also promote good behavior by facilitating information flow that enables collective monitoring and sanctioning of deviant behavior among partners (Burt and Knez, 1995; Rowley, 1997). In other words, referrals likely stabilize the potential dyadic relationship between ego and target by fostering a concern for local reputation in the target.

Structural Holes in Entrepreneurs' Personal Networks and Referral Based Search

The costs and benefits of referral based search outlined above would vary with entrepreneurs' ego-centric network structure. Specifically, I argue below that greater structural holes (Burt, 1992) in the entrepreneur's egocentric network would reduce the costs of referrals in two ways. First, when structural holes are greater, contacts are more diverse and don't circulate in the same pool of information (Burt, 1992). This makes it more likely that the focal entrepreneur could use referrals to access a broader set of exchange partners. In other words, when structural holes are greater, it is less likely that search through referrals would be restricted to a narrow portion of the opportunity space of potential exchange partners.

Second, the simmelian tie formed by referral is likely to be more constraining when entrepreneur's ego-centric network has few structural holes. When structural holes are few, the simmelian tie (between ego and target) formed by the referral is more likely to be embedded in a clique that involves more than just three persons. This is because the dense ego-centric network makes it likely that the target is known to more than just the current contact that provided the referral. The dense connections within the clique make it more likely that norms of behavior are much better developed and more intensely policed (Podolny and Baron, 1997). So, the bargaining power of the focal entrepreneur is reduced considerably when structural holes in the ego-centric network are few.

There is a potentially countervailing argument that greater structural holes could in fact increase the costs of referral to ego. Specifically, many structural holes in the ego-centric network imply the entrepreneur is a member of multiple cliques that could have potentially conflicting norms of behavior. This could constrain the entrepreneur's actions if they are *publicly* observable (Krackhardt, 1999). However, it is reasonable to assume that in this context, ego-centric network contacts are likely drawn from different sectors (i.e. network range is fairly high) and therefore ego's behavior within a clique is less likely to be publicly observed by other cliques. Hence, the constraint of having to publicly conform to multiple conflicting clique norms is unlikely to be an issue, making the countervailing argument less likely in this context. In sum, entrepreneurs with many structural holes in their ego-centric network gain the same benefits at a lower cost while engaging in referral based search for new exchange partners. This leads to the following baseline prediction:

> H1: More structural holes in the entrepreneur's ego-centric personal network leads to a greater proportion of referral based search for new inter-organizational exchange partners

Entrepreneurs' Networking Actions and Search

While the above arguments outline how the pre-existing social structure around the entrepreneur facilitates the mode of search, they assume away differences between actors in how they form new ties or maintain / dissolve existing ties. Network scholars suggest that relaxing this assumption and examining actor level differences could be a way to make theoretical progress. As Kilduff and Tsai (2005:84) note: "All of us have potential links to others who belong to sports clubs, alumni associations or religious institutions that we have joined. Some people, more than others, are successful in forging actual links from these

potential links". A growing stream of literature on employees' networks inside established organizations as well as in entrepreneurship is now examining individual differences in how actors shape their personal networks.

Research on employees' networks examining individual differences can be categorized into two streams. The first stream of research has focused on how relatively unalterable personality traits, such as self-monitoring (Mehra et al., 2001) or Big-Five personality traits (Klein et al., 2004) affect individuals' network structural position and career success. A second stream of research examines more directly the impact of individuals' behaviors related to tie formation. Thus, Obstfeld (2005) finds that employees that were more oriented to initiating tie formation between their existing network contacts (termed *tertius iungens* orientation) were more likely to have greater involvement in organizational innovations. Likewise, Shipilov et al. (2007) show that employees who formed new interpersonal ties at informal events as compared to formal associations or clubs had greater range social capital that positively influenced their career success.

In tandem with research on employees' networking behaviors a handful of studies have started to examine entrepreneurial behaviors relating to relationship formation. Using a large sample quantitative approach, Baron and Markman (2003) show entrepreneurs' impression management behaviors are associated with their financial success, although they do not directly examine relationship formation. More recently, using a grounded theory approach, two studies have examined in fine grained detail entrepreneurial actions related to tie formation. Thus, Zott and Huy (2007) provide evidence that entrepreneurs engaging in more skilful and varied symbolic actions – defined as actions that convey socially constructed meanings beyond their functional use - were more successful in gaining resources from

resource-holders. Hallen and Eisenhardt (2008) outline entrepreneurial strategies that lead to quicker and more successful formation of inter-organizational investment relationships.

Both these process oriented studies provide a rich model of inter-organizational tie formation but do not focus on how entrepreneurs manage existing interpersonal relationships and the possible trade-offs (or synergies) between forming new interpersonal relationships and maintaining existing ones. Since entrepreneurs have limited stock of resources such as their time and energy, examining interpersonal tie formation and tie maintenance jointly provides a more complete understanding of entrepreneurs' efforts to manage their personal network. In addition, Hallen and Eisenhardt (2008) find that new ventures were consistent in their relationship formation success across multiple rounds of investment, suggesting that perhaps individual founders' action repertoires in interpersonal relationship formation and maintenance could be one source of this consistency.

I close this gap in the literature by proposing entrepreneurs' networking efforts related to interpersonal tie formation and tie maintenance can be succinctly described by two formative constructs (Bollen and Lennox, 1991; Bagozzi, 1994). Fornell and Bookstein (1982:292) (emphasis in the original) illustrate the difference between formative and reflective constructs as follows: "constructs such as 'personality' or 'attitude' are typically viewed as underlying factors that *give rise to* something that is observed. Their indicators tend to be realized, then as reflective. On the other hand, when constructs are conceived as explanatory *combinations* of indicators (such as 'population change' or 'marketing mix') that are determined by a combination of variables, their indicators should be formative". A good example of a formative construct is an individual's socio-economic status (SES), which is formed as a combination of four variables: education, income, occupation and residence (Hauser, 1971). Conceptually, if any one of the four variables increases, SES would increase - even if the

other variables did not change. On the other hand, if a person's SES increases, this would not necessarily be accompanied by an increase in all four variables. Analogously, I outline below the formative constructs of network broadening and network deepening actions that summarize entrepreneurs' networking efforts.

Entrepreneurs' Network Broadening and Deepening Actions

Network Broadening Actions

By network broadening actions I refer to entrepreneurs' behaviors in adding new contacts to their personal network. Conceptually, adding new ties to the personal network involves two distinct activities. First, the entrepreneur has to interact with new people that could be potentially relevant to her professionally. Second, the entrepreneur has to acquire enough knowledge about those new people so as to assess (Rangan, 2000) whether to add them as a new personal contact. The first process of reaching out to new people could occur in a variety of different foci (Feld, 1982) such as formal clubs, associations, networking events (Ingram and Morris, 2007) or informal settings such as parties, elevators or airports as well as through a range of different media – such as face to face meetings, telephone, e-mail or other on-line means etc. The next logical step of knowledge acquisition has been documented in the literature in two ways. Nohria (1992) outlines how entrepreneurs directly acquire information about potential new alters' expertise areas, mutually known third parties and current opportunities to work together. In addition, knowledge acquisition on potential new alters may also proceed through non-social mechanisms (Rangan, 2000) such as Google searches.

I propose *network broadening* as a formative construct that is a combination of reaching out to new people and acquiring more knowledge about them. Network broadening actions thus captures entrepreneurs' behavioral repertoires in forming new inter-personal ties. Network broadening is at a maximum when the focal entrepreneur engages a lot in reaching out to

strangers and finding out more about them; intermediate when she scores high on reaching out to strangers but low on finding out more about them (or vice versa); minimum when she scores low on both reaching out and finding out more.

Network Deepening Actions

By network deepening actions I refer to entrepreneurs' behaviors in maintaining existing ties in their personal network. As elaborated below, theory suggests three main pathways through which individuals' behaviors impact maintenance of their existing ties: relational embedding, time pacing of interaction and network culling.

First, entrepreneurs could overlay existing ties with multiple types of content in a process of relational embedding as described by Uzzi (1996). As outlined by Uzzi (1996; 1999), actors vary in the extent to which they embed commercial transactions in social attachments, converting what starts off as a uniplex tie into a multiplex one with both commercial and social content. I posit that entrepreneurs vary in the extent to which they relationally embed their existing ties.

Second, entrepreneurs could pace frequency of interaction with existing ties using temporal markers (Gersick, 1994; Brown and Eisenhardt, 1997). Gersick (1994) focused on the time-paced evolution of a new venture's strategy while Brown and Eisenhardt (1997) focused on tie-paced change in a multiple product innovation context. The common theme here is evolution in which change is synchronized to the passage of time, not the occurrence of particular events. Time-paced evolution could be powerful in uncertain settings such as a new venture context because it creates a regular, explicit opportunity to reassess actions and for information exchange. I posit variation in entrepreneurs' use of time based markers to pace frequency of interactions with existing contacts.

Finally, entrepreneurs could also engage in terminating (or culling) existing ties in a process of pruning (Davis, 2008). While a small stream of research on tie decay has focused on the natural tendencies for relationships to weaken and disappear (Burt, 2000), more recent network research suggests that actors vary in the extent to which they intentionally terminate existing ties.

I propose *network deepening* as a formative construct that is a combination of relational embedding, time based pacing and network culling to capture entrepreneurs' efforts in maintaining existing interpersonal relationships. So, network deepening is at a maximum when the focal entrepreneur engages a lot in time pacing and relational embedding of existing ties and engages very little in culling. Conversely, network deepening is at a minimum when the entrepreneur engages very little in time pacing and relational embedding of existing ties and a lot in culling.

The initial exploratory interviews with a sample of 9 entrepreneurs, described in more detail in Appendix A, painted a picture of entrepreneurs' networking behaviors that was consistent with the deductively derived broadening and deepening actions discussed above. Table A2 in the Appendix illustrates the mapping from the interview raw data to the variables outlined above.

During the early years of their venture, entrepreneurs could potentially allocate their networking efforts mainly to broadening their personal network, or deepening it or some combination of the two. Which of these approaches is likely to be useful for the entrepreneur in the task of adding new inter-organizational exchange partners and thus grow her venture? Qualitative research has identified two different modes in which entrepreneurs search for new exchange partners. One approach is for the focal entrepreneur to directly access the targeted potential exchange partner, as outlined by Nohria (1992)'s account of search efforts by

entrepreneurs in the Route 128 area of Boston. The second approach involves obtaining referrals (Baker, et al., 2003) from the entrepreneur's current personal network contacts that know potentially relevant persons in the target firm.

Networking Actions and Net Benefits of Referrals

I now develop predictions linking networking efforts and mode of search (referrals versus direct) by outlining how costs and benefits of referrals vary with entrepreneurs' networking efforts. It is important to note that the arguments that follow hold true regardless of intentionality. Whether or not entrepreneurs consciously engage in particular networking actions and whether or not they understand or believe in the link between their networking actions and search mode as described below, the costs and benefits, at the margin would play out as outlined.

Main Effects of Network Broadening and Deepening Actions

I argue that the benefits of referral based search outlined in the earlier section would matter much less to entrepreneurs that engage in greater network broadening actions because their networking actions effectively mimic the screening, attention and stabilization benefits provided by referrals without incurring the attendant costs. Greater network broadening actions mimic the screening benefit of referrals because entrepreneurs who score high on network broadening actions come into contact with a wider pool of potentially relevant new people and acquire deeper knowledge about them. This enables such entrepreneurs to screen out less promising leads and concentrate their meager resources on the more promising ones. Greater network broadening actions also mimic the attention benefit provided by referrals because deeper knowledge acquisition about the new people met enables the focal entrepreneur to craft terms of exchange that make it easier to keep the attention of the target. If we assume that targets likely have more alternative exchange partners and are hence much

less dependent (Emerson, 1962) on the focal venture, it follows that greater network broadening actions improves the odds of the target sustaining attention on the focal venture. Finally, because deepening knowledge of new people involves finding out whether ego and the new person are connected through mutually known third parties, greater network broadening actions mimic the stabilization benefit provided by referrals by directly triggering a concern for local reputation in the target. All these arguments suggest:

> H2: Entrepreneurs that engage in greater interpersonal network broadening actions will have a lower proportion of referral based search for new inter-organizational exchange partners for their venture

In contrast, greater network deepening actions – engendered by higher levels of time based pacing and relational embedding and lower level of network culling with existing contacts - will lead to greater proportion of referral based search because of the enhanced benefits of referrals relative to their costs for such entrepreneurs. More specifically, greater network deepening action implies greater frequency of interaction with existing contacts. There are two reasons why this would likely increase the proportion of referral based search. First, all else equal, greater interaction frequency with existing contacts increases the screening benefit of referrals because of greater information exchange between ego and contacts which increases contacts' knowledge of the focal venture's capabilities as well as increases ego's knowledge about potential exchange partners for which he could seek a referral. Second, greater interaction frequency leads to more relational cohesion with personal network contacts (Lawler and Yoon, 1996), making it more likely that a contact is willing to share private information about a target (Uzzi, 1996), and this allows the focal entrepreneur to identify the key needs of the target and craft terms of exchange that make it more attractive

for the target. Greater relational cohesion with contacts also makes it more likely that the contact providing the referral would also try to stabilize the simmelian tie by fostering a concern for local reputation in the target. More formally:

> H3: Entrepreneurs that engage in greater interpersonal network deepening actions with existing contacts will have a higher proportion of referral based search for new inter-organizational exchange partners for their venture

Interaction Effects of Network Broadening and Deepening Actions

While network deepening actions have net benefits, there are two reasons why these net benefits will be lower when focal entrepreneur is also engaging in a lot of network broadening actions. First, meeting more new people and deepening knowledge about them gives entrepreneurs direct first-hand insight into new potential opportunities instead of getting it second-hand from their existing contacts. So, at the margin the value-added of gaining second hand knowledge of new opportunities from increased interactions with existing contacts is lower when entrepreneurs are also engaging in more interpersonal network broadening actions.

Second, while referrals from existing contacts can stabilize the simmelian triad by fostering a concern for local reputation in the target, this key benefit of greater network deepening actions is less compelling for entrepreneurs that also engage in greater network broadening actions. This is so because greater network broadening actions make it more likely that the focal entrepreneur has independently established other sources of mutually known third parties. Because greater network broadening actions implies that entrepreneurs find out more about the new people they meet, including whether they are tied through mutually known third parties, entrepreneurs can trigger a concern for local reputation in the target directly, without taking recourse to the referral from an existing contact. More formally:

H4: The effect of interpersonal network deepening actions on the proportion of referral based search for exchange partners is lower when entrepreneurs' interpersonal network broadening actions is high

METHODS

The essence of the research design was to capture the initial ego-centric network and networking actions of a panel of entrepreneurs. I then followed these entrepreneurs for two months to observe the new people, potentially relevant to them professionally, that they interacted with. Given below are the details on how the sample was identified and the research protocol.

Site and Participants

I compiled a list of entrepreneurs running business-to-business ventures in the IT / IT enabled services sector from well known venture capitalists as well as entrepreneurship oriented associations such as TIE and E-Club in 2 Indian cities – Bangalore and Hyderabad. 102 entrepreneurs from this list were successfully accessed and asked to participate in an academic research project on effective relationship building. Of these, 75 entrepreneurs drawn from 73 ventures, fit the criteria and also chose to participate in the project. All but two of these participants identified themselves as founder/co-founders of their venture and the two non-founders had joined their ventures as CEOs less than a year after founding. There were only three women in the sample. The average entrepreneur in the sample was 35 years old, with 12 years of work experience. While 37 percent of the entrepreneurs in this sample had worked or started a new venture prior to the current one, none of them had prominent exits – in the sense of having sold an earlier venture for significant money. In other words, none of the entrepreneurs in this sample had a track record of accomplishments in building new ventures and this homogeneity in the sample is important since the costs and benefits of

referrals outlined in the theory section is likely to be systematically different for entrepreneurs with strong track record of success. There was little variation in entrepreneurs' educational backgrounds – all of them had at least an undergraduate college degree. The average venture was 3.6 years old, employed 31 persons and experienced annual revenue growth of 87 percent.

Research protocol

After seeking their agreement I had a face to face meeting lasting about two hours to gather initial data and establish rapport. During this meeting, respondents' initial network structure was captured using an ego-centric network survey instrument consistent with (Burt, 1992). Other relevant data gathered include their networking actions, personality traits, work and educational history, details of key existing exchange partners for the venture and other individual, firm and industry level control variables.

I then observed for the next two months the new people that the entrepreneurs in the panel interacted with. During this Phase I of the project, respondents reported the new people they interacted with in one of two ways. In the first option, RAs visited entrepreneurs' work place once a fortnight and photographed the business cards of the new people that the entrepreneur interacted with during the period. In addition, the RA captured in a word document the details of new people met for whom the entrepreneur did not have a business card – either because these new people were met electronically (online; over the phone etc.) or in settings were an exchange of cards did not take place (e.g. meeting at an informal dinner party where there was an exchange of phone numbers but not necessarily business cards). The second option was for the respondents to email the RA a templated excel file containing the details (person name, gender, title, organization name, location etc.) of the new persons they interacted with. In all cases, entrepreneurs were followed up through phone calls and emails and site visits.

Eighty five percent of the sample chose the first option and there was no significant difference in the number of new people met across the two reporting options.

Since entrepreneurs sometimes re-connect with people who they knew before but subsequently lost touch with (e.g. meeting an old high school friend at an airport), for this study, new people were defined as individuals who were either complete strangers or individuals whom the entrepreneur knew earlier but did not have interactions with during the previous three years. Ninety six percent of the new people met in this study were complete strangers.

In addition, since entrepreneurs interact with a variety of new people potentially relevant to them professionally, it was important for this study to distinguish between mere interaction with new people and the formation of a new tie. I do this by defining a new contact as a new person the entrepreneur interacted with that the entrepreneur *wants* to stay in touch with. Initial interviews suggested this is an appropriate way to identify a new interpersonal tie in this context. Shortly after reporting the new people they met and identifying the ones they want to keep in touch with, entrepreneurs received a customized link to a brief web survey. This survey asked entrepreneurs to report whether their venture had an existing or potential relationship with the organization represented by each of the new people met, nature of the relationship (i.e. customer, alliance partner, competitor, investor / banker, supplier, or other); whether the interaction with the new person was because of a referral, and if so, the name and organizational details of the referring individual; location of the interaction with the new person and finally, whether the focal entrepreneur and new person had a shared history in the sense of attending the same educational or work organization.

One month after the Phase I data collection on the new people met, I had another one hour face to face meeting with the entrepreneurs. During this meeting, I administered a structured

socio-metric survey on the new people met in Phase I and a semi-structured interview on their search behaviour. Figure 1 outlines the details of the different points of data collection in this longitudinal design. As given below, data from the face to face interviews, business cards / excel sheet and web survey were used to code the variables used in this study.

Sample attrition

I started with 75 entrepreneurs from 73 ventures because both co-founders of two ventures wanted to participate in this project. Out of this panel, 11 respondents did not provide any data on the new contacts they made during the two month period, effectively dropping out of the project. In addition, three respondents provided partial data on new contacts. All 14 respondents who withdrew from the project cited inadequate time as the reason for dropping out. Complete data for this study was thus available for 61 participants. There was no significant difference in venture age, size and revenue growth between respondents and the drop-outs. Since co-founders' networking action patterns as well as the mode of search is unlikely to be independent, I only include the 'lead' entrepreneur from the two ventures where both co-founders participated in the project, giving a final sample size of 59 respondents.

Measures

Dependent Variable

Proportion of referral based search. The dependent variable in this study is the proportion of referral based search for new exchange partners for the focal venture. This organizational-level variable was coded in three steps as follows. First, from business cards / excel sheet data of new contacts, the list of organizations they represented was drawn up. From this list, organizations that were identified as different business units of the same parent organization

were merged. For example, “SAP Labs” and “SAP India” were treated as business units of the same organization – “SAP”. This resulted in a list of unique organizations the focal entrepreneur came in contact with during the two-month period. Second, from the web survey, I coded new organizations as those that did not have an existing relationship with the focal venture but were instead reported as a *potential* exchange partner – in other words, a potential customer or alliance partner or supplier or investor/banker.

Third, from the web survey data, I identified whether a new contact was met through a referral and whether the person who provided that referral was the focal entrepreneur’s existing network contact, not employed by the focal venture. I then coded a focal new organization as accessed through a referral if at least one of the new contacts representing that focal new organization was accessed through a referral and the referee was an existing network contact not employed by the entrepreneur. Note that I observe a referral from the focal entrepreneur’s self-report of referrals that actually occurred. So I do not observe referral requests made that did not get realized because the referee was either unable or unwilling to help. I took this approach for two reasons. First, the theoretical mechanisms of interest in this study are relevant only to referrals that are successful. Second, feedback from the pilot phase suggested that separating out requests for referrals from their actual realization was confusing and time consuming to report. In addition, I used entrepreneurs’ self-reports of referrals instead of directly asking the referee because entrepreneurs were willing to participate in this research project on the condition that I do not directly get in touch with their existing contacts or the new people they met. However, the risk of biased self-reports is minimal because entrepreneurs are reporting on a clearly observable behaviour and they were unaware of the precise hypotheses for which data was being collected.

The proportion of referral-based search for exchange partners was then calculated as the ratio of potential exchange partner organizations that were accessed through a referral to the total number of potential exchange partner organizations accessed during the two month period. Since this dependent variable is a proportion ranging between zero and one, I use a GLM modeling approach (Papke and Wooldridge, 1996) implemented in STATA.

Independent Variables

Structural Holes: I adapted Burt (1992)'s name generator procedure to capture entrepreneurs' ego-centric network during the initial face to face interview. First, respondents were asked to list up-to 20 individuals who were critical to their entrepreneurial success. After this free recall procedure, they were asked a series of name generator questions. The first one was about the individuals they spent time with socially. Respondents could give a maximum of 4 names. In addition, I asked about sources of help during their transition to entrepreneurship (up-to 3 names); sources of valuable information or expert knowledge (up-to 5 names); sources of strategic advice or counsel (up-to 5 names); sources of support during a business crisis or emergency (up-to 5 names); individuals that help in "opening doors" and provide endorsements for the entrepreneur or her venture (up-to 3 names).

I combined the names generated by the free recall method and the six name generator questions to assemble the initial ego-centric network of the respondent. I limited the maximum network size to 20 names and for the two cases where this limit was exceeded respondents were asked to drop less critical names from the free recall portion. The relationship strength between ego and alter was measured by a five point scale (1= distant & 5= especially close). Focal entrepreneurs also assessed strength of alter-alter ties in their ego-network using three anchor points: (1= distant: individuals don't know each other or rarely work together or dislike each other; 3 = neither distant nor especially close; and 5 =

especially close). I used Burt (1992)'s constraint (c) score to measure structural holes. The extent to which an alter j constrains ego, i, is a multiplication of (a) i's investment of time and energy in the relationship with j and (b) the lack of structural holes around j and is given by the following formula (Burt, 1992):

$$c_{ij} = (p_{ij} + \sum_q p_{iq}p_{qj})^2, \text{ for } q \neq i,j$$

where p_{ij} is the proportion of i's relations invested in contact j and $\sum_q p_{iq}p_{qj}$ is the portion of i's relations invested in contact q who are in turn invested in contact j. Summed up over all the alters, $\sum_j c_{ij}$ is the network constraint measure. Constraint is a function of network size, network density and network hierarchy. The higher ego's constraint score, the fewer structural holes in her ego-network. Since constraint varies between zero and one, to facilitate interpretation, I used (1 – constraint) to directly measure the number of *structural holes* in the entrepreneur's initial ego-centric network. The average entrepreneur reported an initial ego-network of 14.7 contacts with an effective network size of 8.9 and network density of 0.43. *Structural holes* should be positive and significant if H1 is supported

Networking actions: The formative constructs of network broadening and deepening were defined as combinations of five variables that captured entrepreneurs behaviours related to adding new interpersonal ties and maintaining existing ones. I developed and validated a scale to measure these five variables following established procedures for scale development (Spector, 1992; DeVellis, 2003) as described below.

I first generated a large number of items using the conceptualization of networking action variables derived from the initial exploratory interviews (see Appendix A) and from a review of the related literature. My item pool was then reviewed by two researchers who were experts on social network theory and entrepreneurship respectively to assess their content validity. Based on their feedback, I dropped items or modified / re-worded them to improve

their clarity. I administered an e-mail survey with the final list of networking action items to a sample of 200 Indian entrepreneurs/MBA students specializing in entrepreneurship & family business and received responses from 127 of them. I performed exploratory factor analysis (with oblique rotation) on these data and eliminated some items because they did not load adequately or cross loaded. I ended with a final list of 17 items for the 5 networking action variables. Table 1 lists the items corresponding to each variable with the basic descriptive statistics.

This validated scale was administered during the initial face to face meeting to the panel of 73 entrepreneurs that participated in the quantitative portion of the study. To check scale reliability, I performed a confirmatory factor analysis on the data. As can be see from Table 2, the scale items loaded on to the appropriate factors, namely: reaching out to new alters, deepening knowledge of new alters, time based interaction pacing, network culling and relational embedding.

Insert Table 1 & 2 about here

I operationalized the constructs of network broadening and network deepening as follows. I constructed an index of *network broadening actions* by summing the focal entrepreneur's score on the first two networking variables – (i) reaching out to new alters and (ii) deepening knowledge of existing alters. Since the networking variables were operationalized as 7-point scales, this index could range from a minimum of 2 to a maximum of 14. I then constructed an index of *network deepening actions* by summing the focal entrepreneur's score on the other three networking variables – (i) time based interaction pacing (ii) relational embedding and (iii) network culling (after reverse coding). This index could range from a minimum of 3 to a maximum of 21. The two constructs were correlated at 0.36 in the sample. *Network broadening actions* should be negative and significant if H2 is supported; *network deepening*

actions should be positive and significant if H3 is supported. Finally, their interaction term should be negative and significant if H4 is supported.

Being new constructs, it is important to establish their validity. However, unlike scale development for traditional reflective indictors, there is little guidance for index development using formative indicators (Diamantopoulos and Winklhofer, 2001). As Bagozzi (1994: 333) notes, for formative constructs: "the best we can do to assess reliability and validity is to examine how well the index relates to measures of other variables". Hence, I assessed the construct validity of *network broadening actions* and *network deepening actions* by examining their correlations to related constructs in the literature – such as the *tertius iungens* orientation (Obstfeld, 2005), prior socialization and personality dispositions. Obstfeld (2005) provides evidence that actors differ in their orientation towards connecting individuals in their contact network – the tertius iungens orientation. I measured this orientation by asking entrepreneurs to report on a 7 point scale the frequency with which they engaged in the following behavior in the previous year: 'I pro-actively introduce current contacts in my network to each other'. We would expect entrepreneurs who engage more in network broadening actions or network deepening actions to also score high on the tertius iungens orientation. As expected, the tertius iungens orientation is correlated at 0.41 ($p=0.001$) with network broadening actions and at 0.36 ($p=0.001$) with network deepening actions in the sample.

In addition, the social information processing tradition in organization theory (Salancik and Pfeffer, 1978) argues that prior socialization is an important driver of task related workplace behaviors. The implication of this view is that the nature of entrepreneurs' prior work experiences may have a significant effect on networking action patterns. I tested this by examining whether prior experience in boundary spanning roles was positively correlated

with network broadening and network deepening actions. I coded an indicator variable as 1 when entrepreneurs' self-reported primary functional area of expertise was 'Sales/Marketing' or 'General Management'. The data indicates that boundary spanning experience is moderately correlated at 0.19 (*p=0.10*) with network broadening actions but not correlated with network deepening actions.

Finally, in addition to the effect of prior work experience or the orientation to connect others in their network, personality traits could influence individuals' networking actions. (Mehra et al., 2001) find that high self-monitors occupy central positions in friendship networks in organizations. High self-monitors are individuals who are sensitive to the desires and expectations of others, thereby using others' behavior as a guide for expressing themselves (Snyder, 1974). High self-monitors tend to seek out more information, are more accurate in diagnosing social situations, take social cues more into consideration in their behavior, and are more highly skilled at presenting impressions (Snyder, 1974). Low self-monitors rely less on social cues to direct their behavior and more on introspection. We would expect entrepreneurs that are high self-monitors to engage in more network broadening and network deepening actions. Data shows the self-monitoring is correlated at 0.21 (*p=0.07*) with network broadening actions and at 0.14 (*p=0.24*) with network deepening actions. Overall, I conclude that *network broadening actions* and *network deepening actions* exhibit convergent validity with other well-established constructs.

Control variables

The research design controls for industry effects since the sample consists of B2B ventures in the "IT / IT enabled services" industry classification. I then controlled for a number of factors that might be associated with the search mode (referral versus direct) for new exchange partners and which potentially correlate with the independent variables. I first controlled for

firm specific factors using *venture age* (age in years) and *venture size* (number of full time employees). Since the volume of search could affect the mode of search, I controlled for *search volume* using the count of total number of new organizations (i.e. potential exchange partners as well as potential competitors and other new organizations) that the entrepreneur accessed during the two month period. Finally, I controlled for location effects through a dummy variable which was set to 1 for ventures based in Bangalore. I do this because different RAs were used in Bangalore and Hyderabad and the two cities while located close to each other in South India may differ in their micro-institutional context.

RESULTS

The average entrepreneur met 34 new people (potentially relevant to him professionally) during the two month period, of which he reported 25 new contacts - new people met that she wanted to stay in touch with - drawn from 15 organizations. Table 3 provides the correlation matrix and as can be seen, multi-collinearity among the independent variables is not a concern.

The results of the GLM regression on the proportion of referral based search for new exchange partners is presented in Table 4. H1 predicted a positive relationship between the number of structural holes in the entrepreneurs' initial ego-centric network and subsequent referral based search for new exchange partners. As can be seen from Table 4, the coefficient for *structural hole* is positive and significant at $p=0.071$ in the main effect model (Model #2) and the significance improves to $p=0.046$ in the full model (Model #3). I interpret this pattern of results as providing good support for H1. Next, H2 predicted a negative relationship between network broadening actions and referral based search for new exchange partners. As can be seen from Table 4, the coefficient for *network broadening actions* is negative and significant at $p=0.027$ and $p= 0.019$ respectively in the main effects (Model #2) and

interaction effects (Model #3) models, suggesting strong support for H2. In addition, H3 predicted a positive relationship between network deepening actions and referral based search. As can be seen from Table 4, the coefficient for *network deepening actions* is positive and significant at $p=0.086$ in the main effect model (Model #2) and the significance improves to $p=0.041$ in the full model (Model #3). I interpret this pattern of results as providing good support for H3.

Finally, H4 predicted an interaction effect between network broadening and network deepening actions in influencing referral based search. Model #3 of Table 4 reports the interaction effect. As can be seen, the coefficient of *network broadening actions* is negative and significant at $p=0.019$, coefficient of *network deepening actions* is positive and significant at $p=0.041$ and the coefficient of the interaction term *network broadening actions X network deepening actions* is negative and significant at $p=0.048$. These results suggest strong support for H4. Figure 2 presents the interaction effects graphically, for the range of data in the sample, after suitably transforming the predicted values of the dependent variable.

The control variables suggest that entrepreneurs running larger ventures use a greater proportion of referrals in their search while venture age and location are not significant. In addition, the data suggests moderate support for the notion that greater volume of search is associated with lower proportion of referral based search.

I conducted two supplementary analyses to aid in interpreting the results. First, I checked for the impact of personality traits on the results. I included self-monitoring as a control variable but it was not significant and did not change the key findings. In addition, a sub-sample of entrepreneurs (N=52) provided responses to Saucier (1994)'s mini-markers for the Big-Five personality scale. Analysis of this data suggested that *network broadening actions* was significantly correlated with the following two big-5 personality factors: Extraversion

(ρ=0.28, *p=0.04*) and conscientiousness (ρ = 0.29, *p=0.04*). Similarly, *network deepening actions* was significantly correlated with the following two big-5 personality factors: Extraversion (ρ = 0.40, *p=0.01*) and emotional stability (ρ = -0.24, *p=0.09*).Overall, I conclude that the networking action patterns identified in this study, while correlated with personality traits in ways suggested by theory, have independent explanatory power. Second, I tested for an interaction effect between the two networking actions and structural holes to check if having the 'right' network structure makes up for being lazy (or shy) in adding new interpersonal contacts or maintaining existing ones. The interaction terms were not significant.

DISCUSSION AND CONCLUSION

Using a longitudinal design, this study explored how entrepreneurs' networking actions influence the extent to which they engage in referral based search for new exchange partners for their ventures. The findings extend research on personal networks by developing constructs that summarize entrepreneurs' networking actions. In a broader theoretical context, an important contribution of this study is to identify organizational decision makers' networking behaviors as a distinct mechanism through which search for exchange partners operates.

Networking Actions: Implications for Personal Networks

The paper introduced the formative constructs of network broadening and network deepening to succinctly describe entrepreneurs' networking behaviors, based on combinations of the following five variables: (i) Reaching out to new alters; (ii) deepening knowledge of new alters; (iii) time based interaction pacing; (iv) network culling and (v) relational embedding. While network broadening captures entrepreneurs' behavioral repertoires in forming new inter-personal ties, network deepening captures behavioral repertoires in maintaining existing

inter-personal ties. I also developed and validated a scale to measure the two constructs. Scale items were based on grounded research and tested on two different samples of Indian entrepreneurs, which indicated satisfactory levels of face validity and reliability. While further work is warranted to test its institutional and work-context specificity, conceptualizing entrepreneurs' networking behaviors and creating a validated scale to measure those behaviors is an important contribution to the literatures on entrepreneurship and personal networks.

The findings on entrepreneurs' networking actions also have several implications for network theory. First, they underscore the usefulness of a using a formative indicator approach to study phenomenon at the individual level of analysis. As Bollen (1989) states: "Most researchers in the social sciences assume that indicators are effect indicators. Cause indicators are neglected despite their appropriateness in many instances". A recent stream of literature on has emphasized managers' networking behaviors (e.g. Shipilov et al., 2007) and networking capabilities (e.g. Anand and Conger, 2007) as predictors of career success. By focusing on entrepreneurs' actions in forming new interpersonal ties as well as maintaining existing ones this study fills the gap in the literature that has previously focused on either interpersonal tie formation or tie maintenance but not examined them together.

In addition, this study adds to the ongoing research on dynamics of individuals' social capital. Initial research in this area (e.g. Gargiulo and Benassi, 2000) suggested that individuals embedded in dense networks are less likely to adapt their network when faced with an exogenous change in their task environment. More recently, Maurer and Ebers (2006) showed that entrepreneurs who set up organizational processes to manager their external relationships were more successful at adapting their personal network structure to keep pace with changing business requirements. This study's findings imply that entrepreneurs'

networking actions may also mediate the effect of external business requirements on the adaptation of their personal network, with entrepreneurs engaging in greater network broadening actions and lower tie maintenance actions being more effective at adapting their personal network.

Referral Based Search for Exchange Partners: Implications for Partner Selection Research

Initial research on entrepreneurial search focused on institutional underpinnings of search behavior, with Nohria (1992) providing evidence that the inter-connectedness of scientific, educational and commercial institutions in the Boston area facilitated the operation of 'weak tie' generators such as the 128 Venture Group. More recently building on the small-world literature, scholars explored how global features of the network enables or constrains entrepreneurial search. Thus drawing on simulation based evidence, Aldrich and Kim (2007) argue that a small-world network makes entrepreneurial search more likely within the local cluster than outside; in contrast, a truncated scale free network makes search outside the local cluster more likely. These models provide useful insight on *average* behavior within a particular type of global network. However, we know much less about reasons for variation in individual entrepreneurs' search efforts, conditional on the features of the global network they happen to inhabit. By highlighting the differences in the search efforts of entrepreneurs drawn from a single industry and a single institutional context, who are likely to inhabit the same global network, this study sheds light on how entrepreneurs networking actions influence the extent to which they used referrals as a way to search for resources.

Research on partner selection by established firms reveals that organizational decision makers often follow a uncertainty reduction logic in selecting their exchanges by engaging past partners in repeated ties or forming new ties with partners' partners based on referrals

(Uzzi, 1996;Gulati and Gargiulo, 1999). Research investigating new ventures' search for investors (Hallen, 2008) finds a similar pattern. The central finding of this study suggests that contrary to received wisdom, entrepreneurs vary widely in the extent to which they use referrals while searching for new exchange partners. Thus entrepreneurs who scored high on network broadening actions and low on network deepening actions made minimal use of referrals as a way to search for exchange partners because network broadening actions mimicked the benefits offered by referrals while lower network deepening actions increased the costs of using referrals. In sum, networking efforts by organizational decision makers likely seems a distinct mechanism through which partner selection proceeds.

Burt (1992)'s seminal ideas evoke the imagery of individuals behaving entrepreneurially as 'players' in the economic arena, but this stands in contrast to the literature on inter-organizational networks which emphasizes non-risky partnering. This study provides one way to reconcile these differing conceptions by focusing on how search behavior of organizational decision makers mediates the relationship between their personal networks and firm level network positions. In doing so, I demonstrate the usefulness for researchers to consider the interplay between levels of analysis when studying social capital – a call made by Ibarra et al. (2005). The extent to which entrepreneurs in this study engaged in cold calling strangers suggests this inter-play is worthy of more intensive research.

This study's finding that entrepreneurs whose personal network is rich in structural holes are more likely to engage in greater referral based search is also consistent with research in a different domain – on how individuals search for jobs. The job search literature suggests that well connected job-seekers are more likely to use referrals rather than impersonal means (such as responding to advertisements) for job search (e.g. Boxman et al., 1991; Mouw, 2003)). More broadly, the evidence on the effect of structural holes in this study suggests

sufficient similarity of network mechanisms in India compared to developed countries – the institutional context of much prior research. One reason for this similarity could be that referrals are probably even more important for entrepreneurs in developing economies. The literature on national institutional contexts (North, 1990; Khanna and Palepu, 1997) suggests developing economies are generally characterized by missing institutions (such as a well developed rule of law and enforcement of property rights) that are required for the effective functioning of markets. Since a referral based search mechanism could potentially substitute for missing market intermediaries and poor legal systems, search through referral could be especially important in developing country settings.

Opportunities for Future Research

The two great strengths of this study are: a) its longitudinal design for quantitative data as well as qualitative interviews, which together provide a basis for making strong claims on causal ordering and b) the empirical setting of India, which moves the field away from perhaps an over-reliance on North American or European samples for researching entrepreneurial networks. Nevertheless, the findings are based on a relatively small sample of new ventures drawn from a single industry sector in a developing country. So, the extent to which this study's insights generalize to other contexts remains to be investigated in future research.

This study's findings are also a useful starting point for future research along several paths. First, a logical follow on research question is whether mode of search (referral versus direct) affects search outcomes – such as success in establishing an exchange relationship with the target organization or the speed with which a relationship is established. Second, this study focused on what entrepreneurs do to form new interpersonal ties and maintain existing ones.

Future research could devote more attention to whom entrepreneurs connect – how do entrepreneurs ‘screen-in’ new individuals they encounter and whether there is a pattern in those that turn out to provide valuable resources to the entrepreneur. Finally, future research could also investigate how the networking actions identified in this study leave a structural trace. Research on ego-networks (Marsden, 1990) suggests that individuals’ core discussion networks are relatively stable since the contacts elicited through name generators tend to be trusted strong ties. However one implication of this study’s findings is that depending on their networking actions, we should expect variation in the stability of entrepreneurs’ personal network – with greater network broadening actions and lower network deepening actions leading to more churn in the core networks of entrepreneurs. Examining how entrepreneurs’ networking actions affect network structure is an important next step.

In conclusion, while research on entrepreneurial networks has accumulated insights on how entrepreneurs’ social connectedness drive success, there is little understanding of how entrepreneurs build their networks and the micro-sociological processes that link such actions to venture outcomes that matter. This study takes the first step in such a direction.

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Table 1
Scale Validation - Final List of Items Comprising Entrepreneurs' Networking Actions Scale

Networking Action Dimensions	Item	Mean	Std Dev
Reaching out to new alters: The extent to which entrepreneur (ego) takes steps to meet new people to promote his/her venture (alpha = 0.73)	When I attend industry forums & other business related networking events, I interact with people I did not know before	5.1	1.5
	When I attend social events (e.g. alumni meeting, rotary club, hobby associations etc.), I interact with people I did not know before	4.8	1.6
	I interact with strangers (face to face, by phone or online) to promote my business	4.9	1.9
	I consciously set aside time for meeting new people	3.9	2.1
Deepening knowledge of new alters: The extent to which ego finds out more about the new people she meets (alpha=0.70)	When I meet a new person, I find out if he or she is connected to people I already know	4.8	1.5
	I make an effort to find out as much as possible about a new person that I meet	4.7	1.3
	When meeting a new person, I find out how he or she will benefit from our (potential) relationship	4.8	1.6
Time Based Interaction Pacing: The extent to which ego paces her relationship with contacts based on time rather than need (alpha=0.71)	I find it difficult to keep in touch with my contacts without having a specific reason (reversed)	3.8	1.8
	I get in touch with my contacts on a need basis - if I do not have a specific need, I do not contact them (reversed)	4.0	1.7
	When one of my contacts moves jobs, I lose touch with that person (reversed)	4.6	1.5
	I follow a systematic process for keeping in touch with my current contacts	4.7	1.8
Network Culling: The extent to which ego reviews the cost/benefit ratio of relationships (alpha=0.65)	I assess whether my current contacts would be valuable to me in the future	4.4	1.8
	I deliberately keep away from some contacts in my network	3.2	1.7
	I stay away from contacts who make me a "one-stop-shop" for all their needs	4.2	1.9
Relational Embedding: The extent to which ego seeks to combine social and business relations with existing contacts (alpha=0.72)	I take actions to build personal friendships with my business contacts	4.4	1.5
	I socialize with my business contacts	4.4	1.5
	I convert a work relationship in stages to a personal relationship	4.6	1.6

- Respondents were asked to rate how frequently they engaged in the above actions in the previous 12 months on a response scale of 1 to 7 where 1=Never and 7=Always. For the first 2 dimensions, respondents were asked to think about new people (i.e. people not yet part of their personal network) while for the next 3 dimensions, respondents were asked to think about people who were already part of their personal network.

Table 2
Factor Loading of Validated Networking Actions Scale Items (N=73 respondents)

Items	Factor Loadings				
When I attend industry forums & other business related networking events, I build connections with people I did not know before	**0.69**	-0.09	-0.05	0.10	0.19
When I attend social events (e.g. alumni meeting, rotary club, hobby associations etc.), I build connections with people I did not know before	**0.72**	0.21	-0.26	-0.12	0.03
I interact with strangers (face to face, by phone or online) to promote my business	**0.40**	-0.10	0.30	0.00	0.02
I consciously set aside time for meeting new people	**0.45**	0.17	0.21	0.00	-0.09
When I meet a new person, I find out if he or she is connected to people I already know	-0.01	**0.64**	0.11	0.02	0.14
I make an effort to find out as much as possible about a new person that I meet	0.02	**0.72**	0.21	0.06	-0.17
When meeting a new person, I find out how he or she will benefit from our (potential) relationship	0.13	**0.49**	-0.03	0.12	0.15
I find it difficult to keep in touch with my contacts without having a specific reason	-0.07	-0.07	**-0.66**	0.20	-0.08
I get in touch with my contacts on a need basis - if I do not have a specific need, I do not contact them	0.20	-0.16	**-0.83**	0.00	-0.13
I follow a systematic process for keeping in touch with my current contacts	0.19	-0.07	**0.53**	0.26	-0.22
When one of my contacts moves jobs, I lose touch with that person	0.09	-0.06	**-0.60**	0.17	-0.11
I assess whether my current contacts would be valuable to me in the future	0.01	-0.06	0.04	**0.56**	0.09
I deliberately keep away from some contacts in my network	-0.10	0.06	-0.14	**0.63**	0.08
I stay away from contacts who make me a "one-stop-shop" for all their needs	0.09	0.14	-0.11	**0.59**	-0.08
I take actions to build personal friendships with my business contacts	0.15	-0.07	0.18	0.03	**0.61**
I socialize with my business contacts	0.00	-0.07	0.33	0.18	**0.57**
I convert a work relationship in stages to a personal relationship	0.05	0.06	-0.05	-0.09	**0.71**

- Respondents were asked to rate how frequently they engaged in the above actions in the previous 12 months on a response scale of 1 to 7 where 1=Never and 7=Always. For the first 2 dimensions, respondents were asked to think about new people (i.e. people not yet part of their personal network) while for the next 3 dimensions, respondents were asked to think about people who were already part of their personal network

Table 3
Correlation Matrix (N=59)

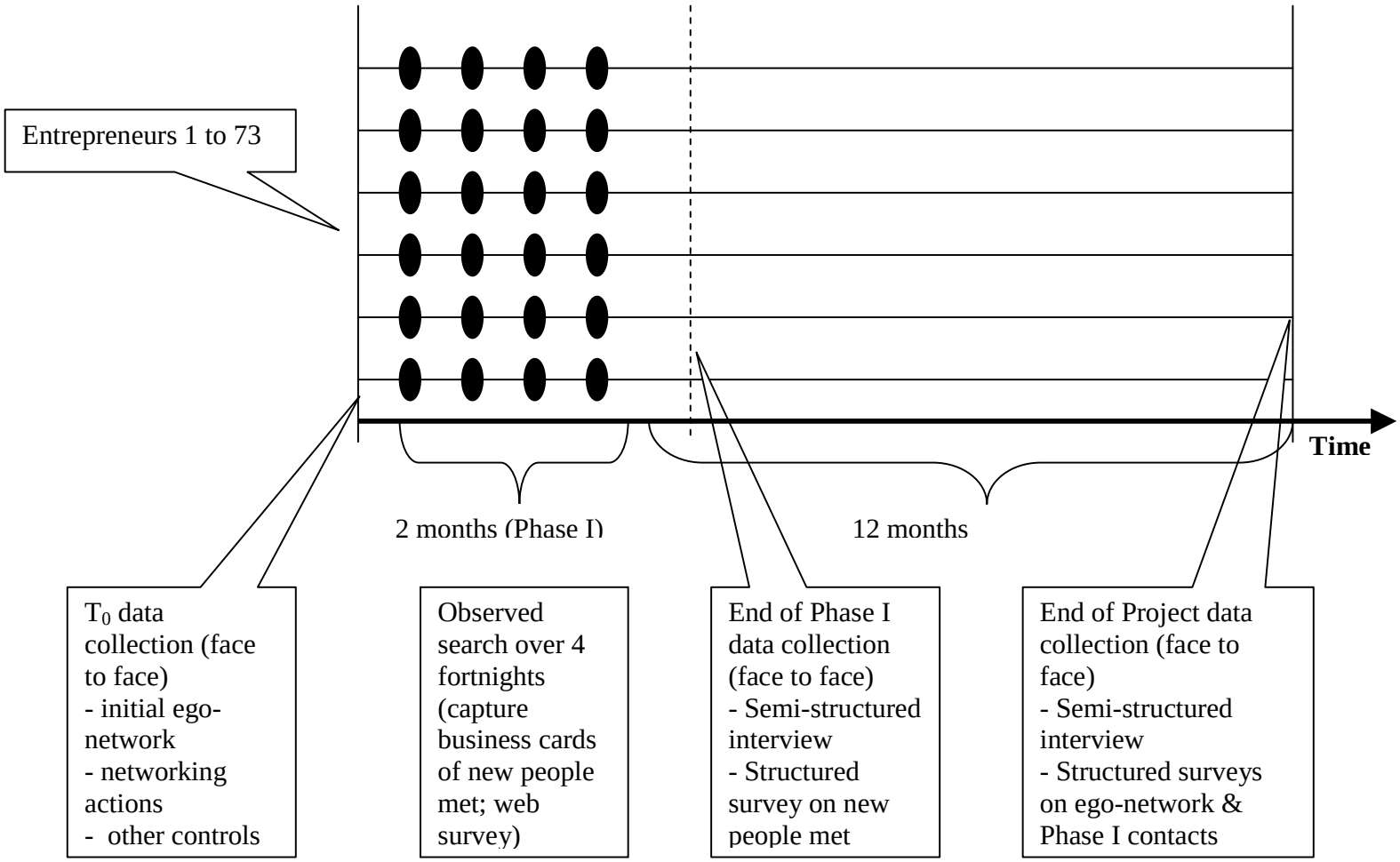
	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Proportion of Referral search	0.34	0.26	-						
2. Venture age	3.6	2.6	-0.05	-					
3. Venture size	31	94	0.30*	0.36**	-				
4. Search Volume	15.0	13.1	-0.20	0.10	-0.04	-			
5. Location	0.75	0.44	-0.13	0.09	-0.20	0.21	-		
6. Structural Holes	0.74	0.08	0.15	0.26*	0.17	0.16	-0.33**	-	
7. Network Broadening Actions	9.4	2.1	-0.23†	-0.15	-0.23†	0.06	0.15	0.07	-
8. Network Deepening Actions	12.3	2.9	0.19	-0.26*	0.06	-0.09	-0.08	0.03	0.36**

Table 4
GLM Model for the Proportion of Referral Based Search for New Inter-Organizational Exchange Relationships [ab]

	Base Model (#1)	**Main Effects (#2)**	**Interaction Effect (#3)**
Venture Age	-0.778 (-1.2)	-0.981 (-1.5)	-0.977 (-1.6)
Venture Size	0.784** (3.0)	0.650* (2.5)	0.584* (2.2)
Search Volume	-0.212† (-1.6)	-0.261† (-1.9)	-0.288* (-2.1)
Location	-0.033 (-0.10)	0.327 (0.94)	0.424 (1.2)
Structural holes		0.344† (1.8)	0.392* (2.0)
Network Broadening Actions		-0.362* (-2.2)	-0.347* (-2.3)
Network Deepening Actions		0.253† (1.7)	0.275* (2.1)
Network Broadening X Network Deepening Actions			-0.204* (-2.0)
No of observations Log Likelihood	59 -27.5	59 -26.5	59 -26.1

[a] The dependent variable is the proportion of referral based search for new exchange partners for the focal venture and ranges between 0 and 1 (inclusive). Table reports standardized regression coefficients. Figures in parentheses are t-statistics. All models estimated using GLM regression with robust standard errors.
†$p < 0.10$ *$p < 0.05$ **$p < 0.01$ (all two tailed tests)

Figure 1
Research Design



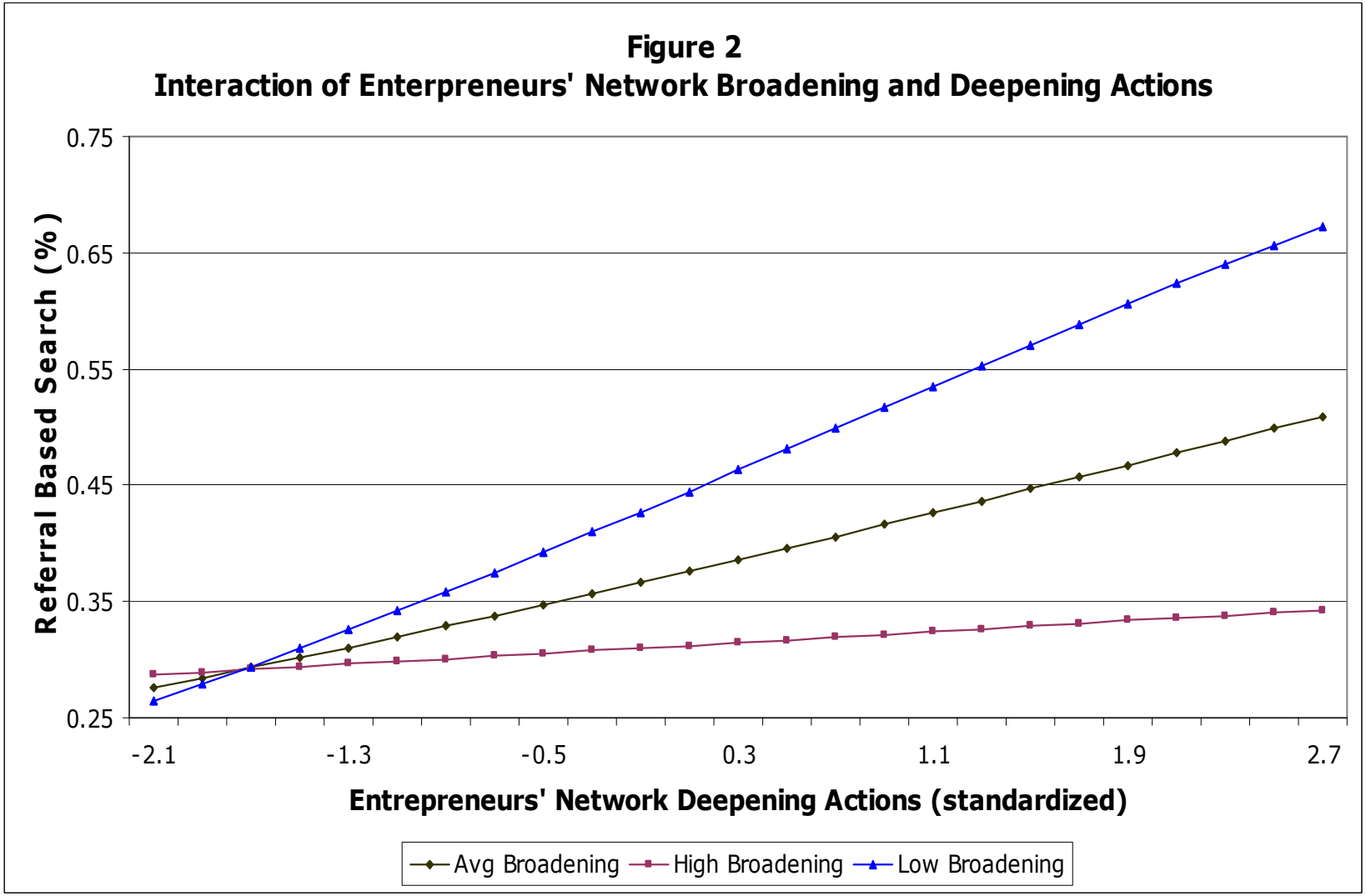


Figure 2
Interaction of Enterpreneurs' Network Broadening and Deepening Actions
Referral Based Search (%)
0.75
0.65
0.55
0.45
0.35
0.25
-2.1
-1.3
-0.5
0.3
1.1
1.9
2.7
Entrepreneurs' Network Deepening Actions (standardized)
Avg Broadening
High Broadening
Low Broadening

APPENDIX A: Initial Exploratory Interviews to Examine Entrepreneurs Networking Behaviors – Methods and Analysis

An officeholder of a peer group organization called Entrepreneurs-club in Bangalore identified members to participate in the initial exploratory interviews for this study which was described as an academic research project on how Indian entrepreneurs build professional relationships in the early years of their venture. To ensure diversity of actions, I asked the E-club office holder to identify individuals that had diverse approaches to forming and maintaining professional relationships. Table A1 provides more background information on the nine participating entrepreneurs.

Insert Table A1 about here

Data Collection

Data from this sample were gathered through open-ended, semi-structured interviews, supplementary conversations and structured surveys lasting a total of 42 hours of interactions with the nine entrepreneurs as well as other individuals (co-founder/ employee or customer) that interacted with them closely. I also examined the ventures' web sites to get information on the ventures' operating history and founders' background and career history.

After a pilot with two entrepreneurs (who were different from the focal sample), I conducted three rounds of interviews with the nine focal entrepreneurs and their associates. Initial interviews were semi-structured and typically lasted about 60 to 90 minutes. Interviews were taped and transcribed. A few months later, I conducted an additional round of supplementary conversations and more structured data collection, lasting typically 60 minutes. Finally, to triangulate accounts by focal entrepreneurs, I collected structured survey data from selected associates - co-founder, employee or customer – that were familiar with the focal entrepreneur's networking actions.

During the initial interviews I first focused on the venture's founding story, business model, key customers, alliance partners and competitors; details of co-founders if any, the focal entrepreneur's background, motivations for launching the venture and the importance of building and maintaining professional relationships. I then initiated a discussion on the entrepreneur's

actions during the previous six months relating to formation of new interpersonal relationships and maintenance of existing interpersonal relationships that were potentially relevant to them professionally. Initial questions were open ended (e.g. What actions did you take to meet new people potentially relevant to your business? What did you pay attention to when you met a new person? How did you keep in touch with existing contacts?). I then asked additional questions that probed deeper to get at the reasons behind the actions they took (e.g. Under what circumstances did you meet new people? How did you find out more about the new people you interacted with? How did you decide whether a new person you met is worth your while to keep in touch with? When do you not keep in touch? What is the cue for you to initiate an interaction with an existing contact? Do you deliberately avoid any of your existing contacts – why? Did you let an existing relationship go 'cold' in the last six months? Why? How did you do it?). This interview ended with questions on whether their relationship formation and maintenance actions had changed significantly since the previous year and prior to their transition to entrepreneurship.

I followed up a few months later with supplementary conversations to fill in gaps in the initial interview data and to ask entrepreneurs to nominate an associate – co-founder, employee, customer or investor – who knew the entrepreneur well enough to answer a brief survey about his relationship building actions. I ended these conversations by asking entrepreneurs to quantify how many new people they met in a month, the number of new people met that they wanted to stay in touch with and the number of months for a typical new contact to provide something of value to the entrepreneur. I then administered a structured survey asking the focal entrepreneur to rate the frequency with which s/he performed a variety of actions relating to formation and maintenance of interpersonal ties. In addition, I administered this same survey to the nominated associate. Finally, a few months later, I interviewed the entrepreneurs again to understand how they searched for new exchange partners for their venture.

Data Analysis

I first identified interview text dealing with entrepreneurs' behaviors (i.e. what they do) – omitting text relating purely to their emotions or motivations. This process yielded a database of 137 codable statements. Each statement consisted of a sentence or a sequence of sentences conveying a coherent point (Weber, 1990) about entrepreneurs' actions relating to formation, maintenance and dissolution of interpersonal ties.

I analyzed this data in four steps employing a data-reduction approach (Lee et al., 1999). In the first step, I induced first-order categories of networking actions very close to the data, using an approach similar to Edmondson (1999) that classifies statements as positive or negative forms of the category. For example, I classified the statement: "*I keep an excel spreadsheet where I record the details of the new contacts I have made…*" as the positive form of being 'systematic and disciplined in meeting new people'. I similarly classified the statement: "*I don't have any fixed routines for meeting new people – I want to do it, but don't find the time for it*" as the negative form of being 'systematic and disciplined in meeting new people'. In a similar vein, I classified the statement "*... I am very open to meeting strangers for business. My key learning about cold calling was the initial email. People respond better when you send them an email first…*" as the positive form of the category 'seeking out new people' and the statement "*…I am very focused in who I interact with - in an event I meet very few new people*" as the negative form of the same category. Likewise I classified the statement "*…what I do is every few months I lock myself up for a few hours and call up my contact list. I just say hello and have a quick chat or leave a message*" as the positive form of the category 'initiating interactions using time based markers' and the statement "*I don't go around talking to people like - hey, I don't have anything to do today, so let me pick up the phone and speak to them. So it's very driven by situations, circumstances and my need to talk*" as the negative form of the same category. This way, I was able to discern eleven data induced first-order categories related to networking behaviors.

In the second step, analogous to Zott and Huy (2007)'s approach, I grouped these eleven first-order categories into five variables based on the functional/intrinsic aspects of interpersonal relationship formation or relationship maintenance they represented. For example, I grouped 'seeking out new people' and 'being systematic and disciplined in meeting new people' into the variables labeled 'Reaching out to new alters' because it denotes the extent to which entrepreneurs takes steps to expand their personal network. Similarly, I grouped 'finding out new contact's areas of expertise', 'understanding new contacts' motivations' and 'finding out connections to common third parties' into the variable labeled as 'Deepening knowledge of new alters' because it denotes the extent to which entrepreneurs find out more about the new people they meet. Likewise, I grouped the rest of the data induced first-order categories into three more variables. At this stage, an expert in qualitative methods who was blind to the study objectives independently coded the 137 statements to the defined five variables. The level of initial

agreement on the coding was 87%, giving an acceptable Cohen's kappa of 0.82 (refer (Lombard et al., 2002). The statements with coding differences were discussed and changes made till consensus coding was achieved. The definitions of these five variables: *reaching out to new alters, deepening knowledge of new alters, time based interaction pacing, network culling* and *relational embedding* - along with their relevant first-order categories and illustrative evidence of the corresponding reported actions by respondents are represented in Table A2.

Insert Table A2 about here

In the third step, following an approach similar to Graebner and Eisenhardt (2004), I assigned to each of the 137 statements a score of plus one if it corresponded to the positive form of a variable and a score of minus one if it corresponded to a negative form of a variable. For example I code as plus one, one of Ram's reported action relating to deepening knowledge of new alters: "*When interacting with a new contact, I find out whether he has decision making authority -how powerful the person is …*" and code as minus one another of Ram's reported action relating to deepening knowledge of new alters: "*I do not find out the hobbies and personal interests of my new contacts*". I then summed the scores for each entrepreneur along the five variables and the results are presented in Table A3. In addition, I developed a structured survey containing a list of 41 items comprising a tentative networking actions scale - derived from the 137 coded statements as well as relevant prior research on interpersonal networks. I asked entrepreneurs to rate the frequency with which they engaged in those 41 actions in the previous 12 months. The 7 point rating scale was anchored from "Never" to "Always". For each entrepreneur, I rated the frequency with which they engaged in the five networking variables by averaging their responses across the relent items. This self-reported survey results matched adequately with the same survey filled-in by the nominated associate on the focal entrepreneur's actions. I then gave a qualitative rating of 'high' when entrepreneurs scored 3.5 or more on the 7 point scale and a qualitative rating of 'Low' when they scored less than 3.5. The quantitative and qualitative scores are reported in the first panel of Table A4.

In the last data analysis step, I combined the five networking variables into the two formative constructs that captured entrepreneurs efforts at forming new interpersonal ties and maintaining existing ones. I summed entrepreneurs scores on the first two networking variables - reaching out to new alters, deepening knowledge of new alters into a network broadening index.

Likewise I summed entrepreneurs' scores on the next three networking variables: time pacing, relational embedding and network culling (after reverse coding) into a network deepening index. Scores on the network broadening and network deepening indices for entrepreneurs in the initial exploratory sample is shown in the second panel of Table A4.

Insert Table A3 & Table A4 about here

Table A1
Description of Initial Exploratory Interview Respondents

	Veer	Nachi	Ram	Suhas	Suma	Krish	Jai	Sunny	Vipin
Gender	Male	Male	Male	Male	Female	Male	Male	Male	Male
Age	38	39	27	37	40	36	34	35	27
Years of work experience	15	14	6	13	19	12	11	12	5
Prior start-up experience	Yes	No	No	No	Yes	Yes	Yes	No	No
Venture's Market	IT training & consulting	Software for electronic device design	Software products & services	Software tools for hardware design	Software solutions for process control	Marketing analytics services	PR & communication analytics services	Software services	Software services for Health consulting & management
Venture Age	7	5	4	4	3	4	5	6	2
Venture Size (head count)	30	30	10	20	42	70	20	100	20
Role in Venture	CEO	CEO	CEO	CEO	CEO	Business Development	CEO	CEO	Business Development
Founding team size	1	3	2	1	2	2	1	1	3
Paying customers	~50	~30	~5	~15	~25	~20	~30	~50	~15
Interviews	3: Veer(2); Employee(1)	2: Nachi(2)	3: Ram(2); Employee(1)	2: Suhas(2)	3: Suma(2); Partner (1)	3: Krish (2); Partner (1)	3: Jai (2); Customer (1)	2: Sunny(2)	3: Vipin (2) Partner(1)

Table A2
Anecdotal Evidence from Initial Exploratory Interviews on Entrepreneurs' Networking Actions

Respondent's Reported Actions (illustrative evidence)		**First-Order Categories**	**Networking Variable**
Positive Form	**Negative Form**		
-"*I meet potential new clients and business partners at hobby associations and alumni meetings – one of the best ways to network*" (Sunny) - "*I frequently interact with complete strangers through email or on-line networking sites for business development*" (Suma) - "*I religiously set aside time for meeting new people. I enjoy cold calling a lot, although now I hold myself on a leash when I cold call*" (Jai) - "*I delegate a lot of my operational jobs to my employees, so I give myself a lot of time to build new connections for business development*" (Suma)	- "*I rarely interact with strangers because I find it difficult. While attending an industry conference, I end up talking to people from the audience who ask questions - and give my own opinion on the question - that's a way for me to connect with the person"* (Suhas) - "*I don't have any fixed routines for meeting new people – I want to do it, but don't find the time for it"* (Nachi)	Seeking out strangers Systematic & disciplined in meeting new people	**Reaching out to new alters** (The extent to which entrepreneur (ego) takes steps to meet new people to promote his/her venture)
-"*I make myself very familiar with a new contact's areas of expertise – their skills sets, backgrounds and what they are good at*" (Jai) - "*I always pride myself on knowing more about a new person I meet than the person knows about me*" (Vipin) -"*When pitching my venture to a new contact, I find out the motivations for the person to engage with me and my venture – is he looking for a feather in his cap, gaining new knowledge etc.*" (Ram)	- "*I don't get a lot of information in the first conversation, but I get some background information. After a few meetings, when I feel people are OK with sharing, I get more information"* (Nachi) - "*when there is no talk about technology or a common ground, I cannot carry on the conversation - talk about other things"* (Nachi)	Finding out new contact's areas of expertise Understanding new contact's motivations	**Deepening knowledge of new alters** (The extent to which ego finds out more about the new people he meets)

Respondent's Reported Actions (illustrative evidence)		First-Order Categories	Networking Variable
Positive Form	**Negative Form**		
-"*I try to ask open ended questions to get a new contact I meet to open up and draw the person out. I always try to act as a sounding board for other people*" (Krish) -"*When meeting a new contact, I find out if we have a common friend or worked in the same company in the past. I find that a good way to establish rapport and find out more about him*" (Jai)	- "*I normally don't find out the hobbies and personal interests of my new contacts or if we have mutual friends*" (Ram)	Finding out connections to common third parties	
-"*Every few months, I take time off to call or email my contacts just to keep in touch or say hello. I often send them articles I come across that I feel may be of use to them*" (Jai) - "*I intentionally manage the gap between interactions with my contacts so there is enough gap to say something new and for me to hear something new*" (Krish)	-"*I do not contact people unless there is a reason. I cannot get in touch with a person to talk about things in general*" (Suhas) - "*I find it difficult to keep in touch with people without having a specific need. I get in touch when I need something from them*" (Veer)	Time based trigger for initiating interactions (Temporal Vs Need based triggers)	**Time based Interaction Pacing** (The extent to which ego paces his relationship with contacts based on temporal markers)

Respondent's Reported Actions (illustrative evidence)		First-Order Categories	Networking Variable
Positive Form	**Negative Form**		
-*"I stop interacting with a new contact – however important he may be – if I am not able to figure out how that person would be helpful to me in the course of six months to a year"* (Krish) -*"I cut off people who make me an agony aunt – because they are not able to connect with a broader set of people. I nip this in the bud - when I do not want to keep connecting with such a person, I talk directly and explain why to that person"* (Suma) -*"Some contacts bring a lot of negative energy and criticism that cannot add value. I actively stay away from such elements"* (Sunny)	-*"When I meet new people that I find interesting, I keep two lists - short term and long term. The short term is people who can give me business in 6 months – the others are long term. I keep in touch with both"* (Suma) - *"Even when a contact asks me for help and favors too many times, I find it very difficult to say no"* (Veer) - *"I don't intentionally stay away from anyone in my network. I might lose touch because of work pressure, but I don't avoid anyone"* (Suhas)	Assessing future value of contacts Exiting potentially imbalanced relationships Avoiding contacts who don't add value	**Network Culling** (The extent to which ego reviews the cost/benefit ratio of relationships)
- *"My friends are rarely my business contacts, but I make friends out of my business contacts"* (Suma) - *"When keeping in touch with an existing contact, I first ask them about business and then focus a lot more on them as people. I ask them about their kids and how they are doing. I always talk about things that are really important for them - usually managing home and work for women & finance and investing for men"* (Krish)	-*"I rarely have lunch or dinner with business contacts – because it's too much exposure – giving them too many points to read me on"* (Jai) - *"I tend to keep my business and social contacts separate and not mix them up"* (Sunny) - *"I do discuss non-work stuff with my business contacts but I wouldn't say it consumes significant time… yeah, I mean I wouldn't know their hobbies or personal life"* (Ram)	Creating friendships from work related interactions Focusing on the contact as a person rather than his role	**Relational Embedding** (The extent to which ego seeks to combine social and business relations with existing contacts)

Table A3

Initial Exploratory Interviews – Valence Scoring of Networking Actions[a]

	Reaching out to new alters	Deepening knowledge of new alters	Time based interaction pacing	Network culling	Relational embedding
Jai	5	3	3	2	0
Krish	2	7	6	3	5
Suma	5	2	3	2	2
Sunny	4	4	2	3	1
Vipin	4	3	1	2	2
Nachi	0	-1	-1	1	-1
Ram	0	-1	0	0	-2
Suhas	-4	0	-3	-1	0
Veer	-1	1	-2	-1	-2

[a] Positive form of an action was given +1 point and the negative form of an action was given -1 point. I summed these points to get a total valence score. Higher valence score on a variable implies engaging in more of that action

Table A4

Initial Exploratory Interviews – Frequency of Networking Actions[a]

	Reaching out to new alters		Deepening knowledge of new alters		Time based interaction pacing		Network culling		Relational embedding			Network Broadening Actions	Network Deepening Actions
Jai	4.7	High	5.8	High	4.8	High	4.4	High	4.0	High		High	High
Krish	4.9	High	5.1	High	4.4	High	4.4	High	5.1	High		High	High
Suma	5.0	High	5.1	High	4.8	High	3.4	Low	4.8	High		High	Medium
Sunny	4.7	High	5.2	High	4.2	High	4.6	High	5.2	High		High	High
Vipin	4.3	High	5.4	High	5.4	High	4.3	High	5.3	High		High	High
Nachi	3.4	Low	4.1	High	2.8	Low	3.1	Low	3.7	High		Medium	Medium
Ram	4.0	High	3.4	Low	3.4	Low	2.4	Low	3.9	Low		Medium	Low
Suhas	3.0	Low	2.8	Low	1.4	Low	2.4	Low	2.9	Low		Low	Low
Veer	3.0	Low	3.3	Low	3.0	Low	3.1	Low	3.1	Low		Low	Low

[a] Entrepreneurs rated on a 7 point scale how often they engaged in each of 41 networking behaviors during the previous year. These behaviors were developed from the interview data. Index of network broadening actions is based on first two actions & index of network deepening actions based on last three actions.

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