Family Matters: Gender, Networks, and Entrepreneurial Outcomes*

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Abstract

In this article, we explore several factors that may have an effect on business start-ups, focusing on possible gender differences. We conceptualize social capital as inhering in people's relations with others and examine the association between men's and women's social capital and their likelihood of starting a business. Two aspects of respondents' social capital are highlighted: the extent to which their business discussion networks are heterogeneous and the extent to which they contain a high proportion of kin. We show that a high proportion of kin and homogeneity in the network, rather than a high proportion of females in the network or being female, are critical disadvantages facing potential small business owners.

Historically, men have enjoyed several advantages over women in their life chances. For example, men have had, on average, higher occupational status, a higher rate of self-employment, and higher incomes than women (Reskin 1993). Female-dominated occupations have been devalued, in part, because Americans consider work done by women less valuable, less important, and less difficult (England 1992). Men have also owned and controlled the great majority of businesses. In 1990 the self-employment rate[1] for men was 12%, whereas it was only 6% for women (Devine 1994). However, in the past several decades, women have made gains in occupational status, income, and business ownership. Many women are now employed in traditionally male occupations, and the pay gap between men and

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women has decreased (Reskin 1993). In addition, female business ownership has risen dramatically. Since the 1970s, women have experienced a sixfold increase in their share of U.S. businesses (Baker, Aldrich & Liou 1997; Devine 1994).

In this article, we explore the effects that social networks may have on women's inroads into business ownership, using unique social network data from a longitudinal sample of owners and potential owners in the Research Triangle Park area of North Carolina. We examine the actions of *nascent entrepreneurs* — persons who are seriously attempting to start a business, a category that includes persons who are not currently business owners as well as existing owners. We focus on social capital in business start-up, following Lin's (1999) conception of social capital as channels of access to resources that inhere in someone's social relations. Such ties provide differential incubation prospects for new business ideas, depending on the quality of the information and resources flowing through them. Indeed, few founders begin their businesses as solo endeavors (Reynolds & White 1997). Instead, they draw upon support and assistance from others to whom they are tied by personal and professional connections.

The viability of a new venture depends, in part, on how well nascent entrepreneurs gauge the environment in which they choose to start a business and on how well they can capture resources in order to survive after start-up. We argue that the diversity and composition of nascent entrepreneurs' social networks provide access to information and resources that change the likelihood of starting a business. We examine men's and women's networks and focus specifically on heterogeneity and kin composition, because much of the network literature points to gender differences in these dimensions of personal networks. Research has shown that men tend to have more diverse networks than do women, which, in turn, may provide subtle advantages to men.

Social Capital

Theorists have disagreed over the definition and interpretation of the term *social capital* (for the multiple definitions and usage, see Bourdieu 1986; Burt 1997; Coleman 1988; Lin 1999; Putnam 1993). Bourdieu (1986) and Putnam (1993) used the group as the level of analysis in their arguments that groups collectively enhance their members' life chances through social capital. By contrast, Lin (1999) used the individual as the unit of analysis to argue that social capital is instrumental for business and work in a way similar to that of human capital investments. Coleman (1988) seemed to use the term with both a collective and individual referent. He saw social capital as a resource for social action that could lead to the acquisition of other forms of capital, human and physical. Similarly, Burt defined social capital as a quality created between people, and Sik and Wellman (1999) referred to valuable social ties as "network capital." We use *social capital* to indicate

the relationship characteristics of a person's ties to others who may provide access to important resources.

Arguments concerning the value of social capital suggest that part of the difference in business start-up rates between male-owned and female-owned businesses might be explained by differences in social capital accumulation created through ties. Interpersonal connections are a significant informal source of information about opportunities and available resources for occupational mobility and improved life chances (Campbell 1988; Campbell, Marsden & Hurlbert 1986; Marsden & Hurlbert 1988). By extension from these arguments, social capital can play a similar role in business start-ups. If there are consistent differences between the social networks in which men and women are embedded, and if such information affects business start-ups, then a partial explanation for differential start-up rates by gender could be found in people's differential possession of social capital.

We are specifically interested in the effects of network composition and heterogeneity on the likelihood of an individual's attempt to start a business. We focus on information and social support networks. These are very different from resource, exchange, or joint-venture organizational networks, which involve the flow of tangible capital resources. Our theoretical interest rests in the immediate circle of discussion partners surrounding a nascent entrepreneur, defined as a set of alters with whom a given entrepreneur discusses business matters. Such persons have the potential to influence nascent entrepreneurs' recognition of business opportunities, as well as the quality of their economic decision making. A key characteristic of such networks, affecting the types and quality of information obtained, is the relationship heterogeneity of the alters.

Our hypotheses thus focus on the informational and social support resources provided by business discussion networks, guided by three principles. First, people can maximize the value of the information they receive if they have low redundancy among the alters in their discussion network (Granovetter 1973). Therefore, the greatest returns to social capital occur for nascent entrepreneurs with many nonredundant ties. Second, kinship ties — by virtue of their common origin in the family — are likely to generate information drawn from a homogeneous pool. Kinship ties thus provide lower levels of new information (Marsden 1990). Third, access to information about opportunities and social support from peers are key bridges between one's intention to start a business and actually doing so (Denison, Swaminathan & Rothbard 1994).

Before explaining the rationale for our hypotheses, we review the central concepts of social network analysis relevant to gender differences. We illustrate our two major independent variables — heterogeneity and composition — and explain their theoretical significance.

GENDER AND NETWORKS

Researchers have found that men and women are embedded in different social networks and have suggested that network differences lead to divergent economic consequences (Popielarz 1999). Several studies have shown that women tend to nominate more kin as people with whom they "discuss important matters" (Marsden 1987; Moore 1990). In fact, women in the same social situation as men tend to have more homogeneous networks in terms of kin composition (Marsden 1987; Moore 1990), either because of induced homophily or choice homophily (McPherson & Smith-Lovin 1987).

In studies of business owners, researchers have replicated many of the findings from surveys of the general population. Evidence from a limited number of surveys suggests that men and women business owners resemble the general public in the composition of their personal networks. For example, using the Research Triangle Entrepreneurial Development Study (EDS), Renzulli (1998) found that women business owners included more kin in their business discussion networks than did men. By contrast, men owners included more coworkers in their networks than did women.

Researchers have interpreted gender differences in network composition as posing a disadvantage for women in the business world (Liao & Stevens 1994; Moore 1990). Women who include greater proportions of kin in their discussion networks may secure greater social support than men, but at the cost of sacrificing the necessary instrumental support needed for economic achievement (Fischer & Oliker 1983; Hurlbert 1991). Social support provides the emotional strength owners and managers need to cope with daily exigencies, but such ties may also limit the diversity and reach of women's networks.

However, despite men and women owners' differences in network characteristics, researchers have not found differences in the *consequences* of these characteristics for how owners use their networks (Katz & Williams 1997). Reese and Aldrich (1995) found that networking activity, defined as the time spent building and maintaining business contacts, was not essential to business survival. Furthermore, they found that survival rates and general economic performance were not significantly related to global measures of networking activity. Aldrich, Elam, and Reese (1997) reported that women owners were just as aggressive as men in searching for advice and assistance through their networks and just as successful in obtaining what they sought. These findings suggest that the type of information and support provided by business discussion networks may have little impact on the survival of businesses after they are founded. However, the likelihood of business start-up may still depend on network heterogeneity and composition.

Heterogeneity

Granovetter (1973, 1974) argued that people who have contacts in more places (a greater range) have greater access to resources and information. Heterogeneity is the most direct indicator of the diversity of an individual's interpersonal environment. High diversity implies integration into several spheres of society, which is often advantageous for instrumental action (Marsden 1987). Networks that are diverse help people reach other social realms and avoid redundant information. A redundant relation is one in which the same information or resource could be obtained from other relations (Burt 1992). A given piece of information obtained from a member of a heterogeneous network is likely to be unique because actors in the network draw information from different sources. However, most people's relations are within clusters containing people who are similar to themselves along multiple dimensions, such as race, sex, and age (Blau 1994).

The more heterogeneous someone's discussion networks, the greater the likelihood that they can obtain nonredundant or diverse information (Blau 1977). For example, Popielarz (1999) argued that an organization's demographic mix affects a member's opportunity to form network ties with dissimilar others. Heterogeneity may increase potential owners' social capital by deepening or extending their knowledge through indirect ties to others beyond their immediate circle. A heterogeneous network may also compensate for an individual's biased or incomplete perceptions and raise expectations for business start-up.

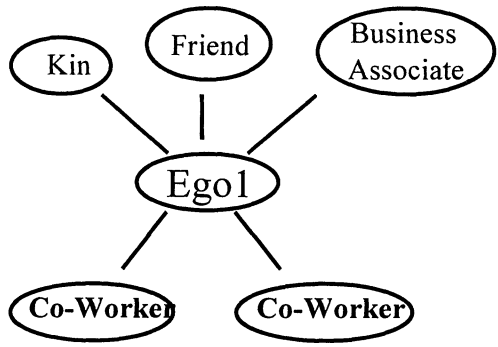
Hypothesis 1: The greater the heterogeneity in an individual's discussion network, the greater the likelihood he or she will start a new business.

Kin Composition

The concept of network composition refers to the precise mixture of alters in a social network (Marsden 1987, 1990). Whereas heterogeneity captures the mere diversity of network alters, the concept of composition captures the type and mix of alters as well. The category of kin includes spouse, parents, siblings, and in-laws; that of nonkin includes friends, neighbors, coworkers, consultants, and group or association members. Figure 1 illustrates the possible difference between the extent of heterogeneity and the percentage of kin in someone's discussion network. Networks A and B have the same heterogeneity scores: each actor reaches the same number of diverse alters. The two networks, however, differ in their composition. Network A has a higher proportion of coworkers and network B has a higher proportion of kin. Thus, both concepts, heterogeneity and composition, are crucial in understanding someone's personal discussion network.

FIGURE 1: Heterogeneity and Composition

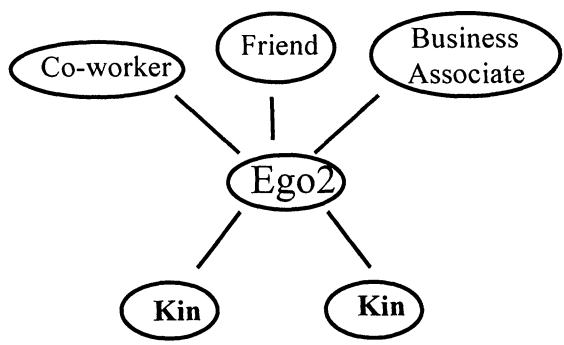
Network A



Composition = 2/5 coworker
1/5 kin

$$\left[\left(\frac{1\text{ kin}}{5}\right)^2+\left(\frac{1\text{ business associate}}{5}\right)^2+\left(\frac{2\text{ coworkers}}{5}\right)^2+\left(\frac{1\text{ friend}}{5}\right)^2\right]=.72$$

Network B



Composition = 1/5 coworker
2/5 kin

$$\left[\left(\frac{2\text{ kin}}{5}\right)^2+\left(\frac{1\text{ business associate}}{5}\right)^2+\left(\frac{1\text{ coworker}}{5}\right)^2+\left(\frac{1\text{ friend}}{5}\right)^2\right]=.72$$

Note: For heterogeneity, see equation 1.

Previous research has suggested that kin ties are less likely than nonkin ties (especially coworker ties) to provide instrumental resources and unique information (Fischer & Oliker 1983; Moore 1990; Wellman 1990; Wellman, Carrington & Hall 1988; Wellman & Wortley 1990). For example, family members are much more likely to share information with each other than are nonkin members. Therefore, if individuals have a large proportion of kin members in their network, they may be at a disadvantage in the business community because their social ties are more inward-looking. A high proportion of kin in a network may indicate a high level of redundancy in information sources.

Hypothesis 2: The greater the proportion of kin in an individual's discussion network, the lower the likelihood he or she will start a new business.

Other Factors

Our two hypotheses focus exclusively on social capital for business start-up. We concentrate on heterogeneity and kin composition because the main thesis of our article is that quality of ties facilitates business start-up. Because men and women also differ in the number of women in their networks, our analysis takes into account the gender composition of nascent entrepreneurs' networks.[2]

Our analysis also includes factors such as life stage, employment status, and human capital to fully specify our model and ensure that our results are not spurious. We discuss previous research in which these factors have been the focus of analysis, and we comment on the effects of these other factors, but we do not present formal hypotheses about them.

Across entrepreneurial samples, researchers have found that the average age of business owners is generally greater than that of employees (Aldrich, Elam & Reese 1997; Aldrich, Renzulli & Langton 1998; Carter 1997). A nascent or established owner's age is important because throughout their life course, people pick up additional contacts and social support through their involvement in associations, work, and family activities. Marriage and parenthood are life-stage events that may also affect ownership. The presence of a spouse indicates that a respondent has a social tie to at least one other person and thus is not a social isolate. A tie to a spouse can, in turn, link respondents to others who can provide information and possible resources.

Marriage is not only a tie but also a potential constraint on economic activities due to gender-based expectations. For example, single women are similar to married men, and unlike married women, in their ability to allocate their time to business activities with little regard to domestic responsibilities (Starr & Yudkin 1996). Thus, it would seem likely that single female owners could begin and pursue business start-up activities more easily than their married counterparts. However, according to a Wisconsin study and data from the Current Population Survey,

female owners are at least as likely to be married as are male owners (Carter 1997; Devine 1994). Because these studies focus on respondents' current employment, rather than the process of moving into new employment, we do not know whether their results will hold for people in the process of starting a business. Children can also constrain someone's likelihood of entering self-employment. Married people with children are likely to face the competing demands of family life and business ownership and be more constrained in how much time they can devote to business than are nonparents (Shelton & Daphne 1996).

A person's employment status may also influence business start-up chances. Prior employment histories can affect a person's likelihood of following through on intentions to be self-employed by raising or lowering their stock of human capital and their career expectations. Thus, career histories and specific career trajectories push or pull someone into self-employment. Although some research points to unemployment as a push factor into self-employment (Evans & Leighton 1989; Storey 1991, 1994), other data reveal that the great majority of new owners have full-time employment directly prior to ownership (Aldrich, Renzulli & Langton 1998; Carter 1997; Manser & Picot 1999; Reynolds & White 1997).

Starting a business is a process that includes intentions or serious thought about business ownership. Thus, people who had an idea or inclination toward self-employment are more likely to actually move into the nascent stages of ownership if other influences are present (Carter 1997). However, intentions do not always come to fruition. Many people think about starting a business but never actually go through the stages to become an owner (Carter 1997; Reynolds & White 1997). Nevertheless, intentions are a first step toward ownership and thus should be included in analyses of start-ups.

Human capital is the investment in technical skills and knowledge that boosts someone's earning power (Becker 1964). People invest time and money in their education so that they will be able to negotiate for better jobs and more income based on their skills (Lin 1999). Thus, sociologists and economists alike have used years of education to measure human capital. In the case of business owners, some research has found that they have about the same level of educational attainment as the general public (Aldrich, Renzulli & Aldrich 1998; Gartner 1988), whereas others have found contrary results (Reynolds & White 1997).

Previous research has shown that women tend to have more ties to women than to men (McPherson & Smith-Lovin 1986; Popielarz 1999). Even though women have made substantial gains in occupational status and authority over the past few decades, they still on average occupy more disadvantaged positions than men do (Reskin 1993). Thus, if someone's ties are primarily to other women, this could also be a disadvantage in the business community for gathering information and other resources.

Research Design

The data consist of a panel of individuals in the early stages of business formation, owners of established organizations, and people providing services to new organizations. We tracked respondents over a two-year period, from 1990 to 1992.

Data

We use data from the Research Triangle Entrepreneurial Development Study to explore the networks of nascent entrepreneurs and business owners. Participants were located in the Research Triangle area of North Carolina, an area previously studied by Aldrich et al. (1989), Campbell (1988), Kalleberg et al. (1990), and others. Campbell (1988) analyzed gender differences in job-related networks by contacting people through the firms that employed them in the region. Kalleberg et al. (1990) and Aldrich et al. (1989) used the same region to study differences in the coverage of various organizational sampling frames. Luger and Goldstein (1991) found that economic development efforts in the Research Triangle area were similar to programs in other regions that attempted to promote growth through science parks. Based on these studies and others, we believe the Research Triangle area of North Carolina is a valuable laboratory in which to study business start-up and growth.

The respondents in this sample were selected from people with entrepreneurial or business activity memberships and involvement, drawn from organizations in Durham and Wake Counties, North Carolina,[3] participants in technical-college small business classes in Wake County, and a random sample of new business owners in Wake County. The sample thus includes information on current small business owners (those with an active business) and two groups of people qualifying as nascent entrepreneurs: people actively trying to start a business and those who are thinking about becoming business owners. According to Reynolds and White (1997), our sample includes nascent entrepreneurs because we have included people who have taken action in the first steps toward business ownership, such as joining a business organization and taking an entrepreneurial class. Reese (1993) conducted analyses in which she included a dummy variable for her randomly drawn subsample, contrasting it with her purposively drawn subsamples, and showed that sample source was not a statistically significant predictor of network composition or networking activities.[4]

Two waves of information were collected, the first between 1990 and 1991 and the second in 1992 (see Reese 1993 and Reese & Aldrich 1995 for a full description of the data). Phase 1 of the first wave was a short mailed questionnaire, and phase 2 involved an in-depth telephone interview with those who returned the questionnaire. In the first phase, 659 questionnaires were mailed out and 444 returned. Telephone interviews were completed for 353 of the respondents who returned a mailed questionnaire. The survey thus had a completion rate of 67% of those who received a mailed questionnaire and a response rate of 54% of the original sample who completed a mailed and telephone questionnaire. We used only those wave 1

respondents who completed a phone interview, as they were asked the social network questions we used to construct our independent variables.

For the second wave (collected in 1992), a mailed questionnaire was sent to all the people who had completed a mailed questionnaire in wave 1. All respondents were also telephoned. Of the 353 who had completed the mailed and telephone questionnaire in wave 1, we received at least some follow-up information on 328 respondents, for a follow-up rate of 93%. These rates are comparable to those in other studies of entrepreneurs (Birley, Cromie & Myers 1990; Cooper & Dunkelberg 1987; Kalleberg 1987; Kalleberg 1986). See Table 1 for the demographic characteristics of our sample.

Variables

We present information on the coding and definition of all variables in Table 2. For the dependent variable and the four central independent variables, we present additional information below.

Business Start-Up

We used the second wave of data to obtain information about business start-ups. Two groups of people were identified on the basis of their business status at wave 1 — business owners and nonowners. Interviewers asked the business owners a series of questions to tap additional business start-ups as well as new business start-ups.[5] Interviewers asked the nonowners if they had started or bought a business since wave 1. Fifty-two respondents started a new business between wave 1 and wave 2 of our interviews. Of the respondents already in business at wave 1, 16% had started a new business by wave 2. Of the respondents who were not owners at wave 1, 31% had started a new business by wave 2.

To measure business formation, we constructed a dichotomous variable for start-up in wave 2 that indicated whether respondents from wave 1 had started a business by wave 2. We have information on 276 cases for business start-up events between wave 1 and wave 2.[6]

Gender

Gender was measured with a dichotomous variable, taking the value 1 for male and 0 for female respondents.

Heterogeneity

Interviewers in the first wave of data asked respondents about the people with whom they talked about business. The respondents were asked the following: "Now I would like to talk about your business contacts. Please tell me the first five people with

whom you feel especially willing or able to discuss your ideas for a new business or your ideas about representing or running your current business." The five people with whom respondents talked about business matters are "strong ties,"[7] and we will refer to these people as the "business discussion network."

Networks are composed of people with many different attributes. An investigator needs to decide which dimension of heterogeneity is relevant, as a person's network can be heterogeneous in some respects and homogeneous in others (Blau 1977; Marsden 1987). For example, someone can have a network made up of all kin members, and that network is homogeneous with respect to kin. Yet each of the kin members may have a different occupation, and thus the network is heterogeneous with respect to occupation. Because we were interested in whether potential owners gleaned information from multiple sources, we focused on the differing social dimensions within which relationships with alters arose: work, friendship, family, and membership groups.

Moore (1990) and other researchers have used separate OLS models for each relationship type to measure absolute network composition. By contrast, we prefer to use a general measure of heterogeneity, because it is a concise measure of network diversity. We asked respondents their relationship to each of the persons in their discussion network. Respondents could list up to three relationship categories for each alter (similar to the General Social Survey format). For the heterogeneity measure, we categorized an alter by using the first relationship the respondent named. The name generator provided six categories that make up the absolute composition of business discussion networks: kin, friends, coworkers, business associates, consultants, and fellow group or association members. We defined network heterogeneity as the probability of randomly choosing people with two different attributes from the possible six attributes. We calculated it as follows:[8]

$$1 - \left[\left(\frac{\#\ \text{kin}_i}{\text{total}} \right)^2 + \left(\frac{\#\ \text{business associates}_i}{\text{total}} \right)^2 + \left(\frac{\#\ \text{coworkers}_i}{\text{total}} \right)^2 + \left(\frac{\#\ \text{consultants}_i}{\text{total}} \right)^2 + \left(\frac{\#\ \text{friends}_i}{\text{total}} \right)^2 + \left(\frac{\#\ \text{group members}_i}{\text{total}} \right)^2 \right]. \quad (1)$$

A heterogeneity score equal to 0 indicates a perfectly homogeneous network, whereas a heterogeneity score approaching 1 indicates a more heterogeneous network.

Proportion of Kin

We measured the percentage of kin members that ego nominated in the business discussion network as the ratio of kin to all persons named. As we note above, respondents had the opportunity to classify each alter into three relation categories.

TABLE 1: Demographic Characteristics of Respondents in Wave 1 Who Were Followed Up in Wave 2

Characteristic	Men	Women
Education		
High school or less	8.0 (20)	12.4 (12)
2 years of college	6.8 (17)	22.7 (22)
Bachelor's degree	48.2 (121)	37.1 (36)
Master's degree	26.3 (66)	22.7 (22)
Ph.D. degree	10.8 (27)	5.2 (5)
Race		
White	94.8 (237)	91.8 (89)
Black	3.6 (9)	8.2 (8)
Other	1.6 (4)	0
Family status		
Married	84.5 (212)	69.1 (67)
Single	15.5 (39)	30.9 (30)
Number of children		
0	50.4 (113)	64.8 (57)
1-4	43.4 (109)	32.0 (31)
5+	.8 (2)	0
Run own business		
Currently an owner	77.7 (195)	72.2 (70)
Currently not an owner	22.3 (56)	27.8 (27)
Intend to start a business	29.2 (73)	22.7 (22)
Source of respondent		
Random sample	8.8 (22)	16.5 (16)
Organizational rolls	91.2 (229)	83.5 (81)
Industry		
Manufacturing	7.2 (18)	7.2 (7)
Business services	17.5 (44)	18.6 (18)
Consulting services	16.3 (41)	7.2 (7)
Retail	11.6 (29)	20.6 (20)
Other (R&D, computers, real estate)	25.1 (63)	18.6 (18)
Work history		
Number of years employed full-time		
0	12.8 (30)	24.2 (22)
1-5	25.5 (60)	24.2 (22)
6-11	61.7 (145)	51.8 (47)
Number of years self-employed		
0	33.2 (78)	38.5 (35)
1-5	38.3 (90)	36.2 (33)
5-11	28.5 (67)	25.3 (23)
Start-up between waves 1 and 2	19 (40)	15 (11)

TABLE 1: Demographic Characteristics of Respondents in Wave 1 Who Were Followed Up in Wave 2 (Continued)

Characteristic	Men	Women
Mean age	42	40
N	251	97

Note: Figures preceding those in parentheses are percentages, and those in parentheses are total numbers.

We coded an alter as kin if the respondent classified him or her as kin as the first, second, or third relation type to ensure that we captured all kin alters.[9]

Total Number of People in the Network

The total number of people with whom respondents discuss business is a crude measure of the number of direct contacts but does not limit respondents to listing strong ties. Interviewers asked the respondents to indicate the total number of people with whom they discussed aspects of starting or running a business. The mean number of people was 8.8 and the mode was 5, but the data were highly skewed, with an interquartile range of 3 to 10.[10]

Results

We tested the hypotheses about network characteristics and business start-up in two steps. First we computed descriptive statistics for gender and network characteristics. Then we used multivariate logistic regression models to predict start-up by gender and network characteristics.

Gender and Network Characteristics at Wave 1

Our analyses only weakly confirm previous studies showing that gender is related to network characteristics.[11] Because the distributions of heterogeneity and proportion of kin are discontinuous in very small networks (less than 5), it is important to evaluate the size of each person's business network. Therefore, we explored whether the distribution of number of alters nominated by men and women was the same. The mean number of alters nominated by men and women was 4.7. About 82% of men and 84% of women nominated 5 business discussion ties (the difference between men and women is not statistically significant). Men and women have the same number of diverse alters and similar heterogeneity scores. The mean heterogeneity score for men is .45 and for women is .49, a

TABLE 2: Variables and Coding for Business Discussion Network

	Definition	Coding
Dependent Variable		
Business start-up	Respondents who started or bought a business between waves 1 and 2	0 = didn't start a business by wave 2 1 = started a business by wave 2
Independent Variables		
Social capital variables		
Heterogeneity score	Probability that each alter in the network will have a different relation to respondent from that of all other alters	Range of 0 to 1 (theoretical) where 0 = completely homogeneous network, 1 = absolutely heterogeneous network
Proportion of kin	Number of kin mentioned / total number of alters mentioned (as a function of the number of alters) at wave 1	0-.80 (observed) 0-1 (possible)
Total number in network	Total number of people with whom respondents discuss business at wave 1. Open-ended question not solicited through the name generator.	Range of 0 to 200 (mean = 8.8, mode = 5)
Proportion of female alters	Number of females mentioned / number of alters mentioned (as a function of the number of alters) at wave 1	0-1 (observed)
Life stage		
Marital status	Respondent married at wave 1	0 = not married, 1 = married
Age	Age of respondent at wave 1	22-78 (mean = 41.2)
Presence of children	Total number of children 18 years old or younger living with nascent or established owner	Range of 0 to 8 (mean = .86, s.d. = 1.1)
Human capital		
Education	Level of education attained	4 dummy variables: 1= some college 1 = Bachelor's degree 1 = Master's degree 1 = Ph.D. degree 0 = Other education level, for each dummy

TABLE 2: Variables and Coding for Business Discussion Network (Continued)

	Definition	Coding
Human capital (cont'd)		
Work history	The respondent's work history over the past 10 years: number of years employed full time and number of years self-employed	Continuous variables: Employed: range of 0 to 11 years (mean = 5.2, s.d. = 3.9) Self-employed: range of 0 to 11 years (mean = 3.3, s.d. = 3.7)
Stage of business ownership	Running own business at wave 1	0 = no, 1 = yes
Continuity of business ownership	Running same business at wave 2	0 = no, 1 = yes
Intent to start a business	At wave 1, respondent planned to start a business in the future	0 = no plans, 1 = plans

statistically insignificant difference, as Table 3 shows. Women and men differ substantially in the proportion of female alters in their business networks (.48 versus .18, respectively).

Bivariate analysis, however, supports the typical finding that women nominate more kin in their networks than do men (Marsden 1987; Moore 1990; Renzulli 1998). Fifty-six percent of women nominate one or more kin as part of their business discussion network, compared with only 40% of men. The average proportion of kin for men is .14 and for women is .20, as shown in Table 3, and the difference is statistically significant. The proportion of kin for men and women in this sample was lower than in Wellman (1992a), who found that 55% of men and women named kin in their active networks. Moore (1990), using the General Social Survey, found that the proportion of kin in personal discussion networks was .51 for men and .58 for women. We believe that we found a smaller proportion of kin in our respondents' networks because they were specifically asked to name alters in their *business* networks. General discussion networks may draw more heavily on kin because they often provide emotional support, whereas business networks may draw less heavily on kin and more heavily on other kinds of ties that provide instrumental support.

Start-up by Gender and Network Characteristics

In the final part of our analysis, we used logistic regression in two steps to test our hypotheses about the association between discussion network characteristics and business start-ups. We first ran a baseline model (model 1) without any network

TABLE 3: Mean Network Characteristics for Men and Women in Business Discussion Network

	Men	Women
Number of business discussion alters nominated	4.68 (.84)	4.70 (.75)
Heterogeneity score	.45 (.21)	.49 (.19)
Proportion of kin	.14*** (.21)	.20 (.23)
Proportion of females	.18*** (.21)	.48 (.27)

Note: Standard deviations are in parentheses.

*** $p < .001$ (one-tailed tests)

variables in order to predict start-ups, and then we added the network variables in model 2. The nested models show that the addition of the network variables significantly increases explanatory power from model 1 to model 2. Table 4 shows the results of the multivariate models for start-ups.

As predicted by hypothesis 1, we found that network heterogeneity significantly increased the odds of starting a business, net of intentions, demographic characteristics, and other control variables.[12] The coefficient for heterogeneity's effect on start-up is positive, indicating that diverse ties in a network facilitate the start-up process. In fact, a perfectly heterogeneous network increased the odds of starting a business by a factor of five, net of all other variables (significant at the .05 level, one-tailed). This supports our contention that heterogeneous discussion networks serve as an important resource for nascent owners.

Hypothesis 2 was also confirmed. With respect to kin, we found that the greater the proportion of kin in respondents' networks, the less likely they were to start a new business between the two waves of our study. For a unit increase in the proportion of kin, the chances of starting a business at wave 2 decreased by a factor of .05, net of other network characteristics, individual variables, work history, and human capital variables. In other words, a business network that changes from zero kin to all kin will reduce the odds of a person starting a new business by 95%. We interpret this result as suggesting that the information that kin provide and the time it takes to maintain kin ties create disadvantages for people contemplating a business start-up. Net of the network variables, the gender of a respondent had no significant effect on the likelihood of starting a new business.

When we tested for the possible effect of the gender composition of a respondent's network, we found that adding the proportion of females did not

TABLE 4: Logistic Analysis for Business Start-Ups

	Model 1 No Network Variables			Model 2 Full Model		
Predictor Variables	Coefficient	S.E.	Odds Ratio	Coefficient	S.E.	Odds Ratio
Intercept	–3.51	1.23		–3.89	1.44	.00**
Social capital						
Heterogeneity	—	—	—	1.65	.96	5.23†
Proportion kin	—	—	—	–3.02	1.22	.05*
Proportion female	—	—	—	.67	.89	1.96
Total network size	—	—	—	.00	.01	1.00
Individual variables						
Married	–.01	.49	.99	.13	.51	1.14
Gender (male = 1)	.04	.46	1.04	.22	.55	1.25
Age	.03	.02	1.04	.03	.02	1.03
Number of children	.02	.16	1.02	.01	.17	1.01
Human capital						
Some college	–.59	.87	.56	–.53	.92	.59
Bachelor's degree	.19	.63	1.21	–.08	.67	.93
Master's degree	.04	.68	1.04	–.16	.72	.85
Ph.D. degree	.54	.81	1.72	.22	.86	1.25
Running own business at wave 1	.46	.62	1.58	.44	.65	1.56
Running same business at wave 2	–.65	.51	.52	–.73	.54	.48
Intent to start a business at wave 1	1.21	.41	3.37*	1.22	.41	3.37**
Work history						
Employed	.01	.07	1.01	.01	.08	1.01
Self-employed	.01	.08	1.01	–.02	.08	.98
–2 log-likelihood (N = 246)			219.39†			209.926*

† $p < .10$ * $p < .05$ ** $p < .01$ (two-tailed tests)

significantly change our findings. Proportion of females is not significant, nor does it change the significant negative effects of proportion of kin. Therefore, we are confident that it is the type of relation individuals have to the alters in their personal networks, rather than the gender of the alters, that has the greatest impact on the likelihood of becoming an entrepreneur. We suspect that the proportion of women in our respondents' networks does not significantly affect business start-ups because respondents named people with whom they had discussed business and thus may have named only people (male or female) who have some business knowledge.

We found that the gender of our respondents did not affect the likelihood of business start-up: men and women are equally likely to start a business (in Table 4, gender is not statistically significant). Our sample of owners and nascent owners probably eliminates most women who have been occupationally steered away from business ownership or blocked from considering ownership because of other gender-related factors. According to our data, network composition, rather than gender, is a key obstacle for starting a business. Thus, we find that what differentiates people at this level of interest in ownership is their networks and not their gender.

Among the other variables we included, only intentions had a significant impact on start-ups. Individual variables such as age, education, marital status, and number of children did not significantly affect the likelihood of start-up. Our sample was fairly homogeneous with respect to education and marital status, and this lack of variation undoubtedly played a role in reducing the explanatory power of such factors. Also, because we followed respondents over a fairly narrow time period, factors associated with life-course events were less likely to be significant in our models. A person's work history also did not significantly affect start-ups. But intentions do matter.

Having intentions to start a business at wave 1 significantly increased the likelihood of actually starting one, raising the odds by a factor of 3.4 in both the fully specified model and the restricted model, net of all other variables. People who said they were going to start a business were very likely to carry their plans through. In keeping with the unpredictable world of entrepreneurship, we note that a few people who were neither running a business nor even contemplating a start-up in our first wave nevertheless went on to actually start one.

Conclusion and Discussion

Over the last few decades, women-owned businesses have greatly increased as a proportion of all businesses. We suspect that the observed trend toward a greater number of female-headed businesses stems from an increase in women's social capital. That is, increasing occupational opportunities for women may well be generating increased heterogeneity in the composition of their social networks. The composition of women's discussion networks, especially women with entrepreneurial interests, might have changed in the past few decades. We believe that historical research on trends in women's social networks may lead to a better understanding of the relative increase in female-owned businesses.

In this article, we used a sample of Research Triangle area owners and potential owners, gathered in the early 1990s, to examine the association between the characteristics of owners' and nascent entrepreneurs' social capital and the likelihood that they would start a business. We followed Lin's (1999) and Portes's (1998) conceptions of social capital as inhering in people's relations with others

and focused on the degree to which respondents' business discussion networks were heterogeneous and contained kin members. We treated discussion networks as conduits for information about economic opportunities as well as sources of social support for people who might be hesitant about attempting to start a business.

We found that networks spanning multiple domains of social life apparently provide nascent entrepreneurs with greater access to multiple sources of information than do more homogeneous networks and thus enable them to make the transition from idea to action. Our analyses show that actors with networks that draw information from multiple sources — those with high heterogeneity and a low percentage of kin — are much more likely to start a new business than are those with more homogeneous networks. Evidently, the increased social support provided by kinship ties does not offset the loss of information due to restrictions on network range. Our finding complements research showing that the most valuable social capital a person can mobilize is found via dissimilar ties (Popielarz 1999).

The received wisdom on the relationship between gender and social network composition is replicated in our data. We found that women tended to have more homogeneous networks than men with respect to kin. The network effects we observed held *net* of gender differences, and in analyses not shown here we found no significant interactions between network composition and owner gender. This implies that although men's and women's discussion networks differ in their composition, the mechanisms that link network range and entrepreneurial activity are similar across the sexes. A central conclusion of our study is that networks made up of a greater proportion of kin create disadvantages in entrepreneurial start-up *regardless* of gender. Therefore, based on our results, we conclude that a high percentage of kin in people's networks, rather than their gender or the gender composition of their networks, is a critical disadvantage facing potential owners.

We also found that intentions to start a business may be an impetus for people to mobilize and use their social capital. Although most people who initially reported that they intended to start a business in the near future did not actually do so, enough people did carry through on their intentions to suggest that intentions to start one might affect the extent to which people call upon their networks for assistance. Further research should examine the relationship between intentions and use of social networks.

Future research in network analyses of business ownership should look at the content of the information that passes between individuals and the alters to whom they are tied. Our analysis shows that network composition and heterogeneity are important influences on business start-up, implying that the information found in heterogeneous networks with nonkin ties is unique and useful to nascent entrepreneurs. However, we have not captured the content of ties with our network measurements; that is, we do not know what people are actually talking about when

they meet with the alters in their networks. Instead, we have the characteristics of the network as a whole.

Research on the content of ties by Podolny and Baron (1997) shows the importance of looking at tie content for performance and mobility in firms. They showed that consistent role expectations within dense intrafirm networks affect an employee's likelihood of moving to higher levels. Outside the relatively closed boundaries of firms, however, role expectations may be less important than nascent entrepreneurs' ability to recognize potential resource providers and sustain ties with them. Nevertheless, the content of tie information and the level of role expectations may play a powerful role in the business community.

This article provides insights derived from a unique sample of owners and nascent entrepreneurs. Like all such samples, there are limitations based on sample size and geographic specificity. Although such limitations constrain the generalizability and statistical power of our work, we feel the general processes identified are grounded in a conceptual frame that is not context-specific. Heterogeneous social ties are an important resource that people can tap to improve their life chances. Thus, we suspect that research on business start-ups in other regions should find similar outcomes.

Notes

1. The self-employment rate is calculated as the percentage of people 16 and older who reported themselves as self-employed in a nonagricultural sector.

2. Thanks to an anonymous reviewer who pointed out that some readers may see gender composition as a competing hypothesis to kin composition as a disadvantage in business ownership.

3. The sample was drawn from membership lists for the following organizations: the Council for Entrepreneurial Development, a private nonprofit entrepreneurship promotion based in Durham, North Carolina; six private nonprofit business networking organizations; participants in Wake Technical Community College Small Business Center classes; and a local chapter of the National Association of Women Business Owners. To check on possible sample selection bias, a random sample of businesses registered in Wake County in 1990 was drawn.

4. In analyses not shown here, we replicated and extended Reese's (1993) test for possible selection bias in our sample. We found that sample source was not a significant predictor of our dependent variable, as the groups did not significantly differ from one another.

5. Thirteen respondents were lost because they refused to participate further at the end of wave 1.

6. To check for bias in nonresponse, we created a new test variable, coding the missing cases for the start-up variable as 1 and the others as 0. We then regressed the missing data variable on the independent network variables (proportion of kin, heterogeneity, and network size) and gender. The results (not shown here) were not significant,

indicating that respondents who did not answer the business start-up questions in wave 2 are not significantly different from those who did. Thus we are confident that our results are not influenced by selection bias.

7. The respondents were restricted to naming a maximum of five alters. This restriction limits the inferences we can draw about weak ties, as research has shown that using the name generator method elicits reasonably strong ties (Marsden 1987). Because we asked the respondents to tell us about their business networks, a focused subsample of their networks, we believe that having five named alters will provide an accurate account of the business discussion network. Asking for just five alters may introduce distortions in the data; however, the six relation types were evenly distributed over the five alters. We found no pattern across any of the five alters for any of the relationship types. Thus, there is no reason to suspect that the general pattern changes beyond five people, and thus we do not suspect our data were distorted by limiting the number of alters to five.

8. "Except for modifications due to sampling without replacement or an effort to take into account the true range of possible values for a given number of categories, [our measure of heterogeneity] is basically the same as the Index of Qualitative Variation described by Mueller and Schuessler" (Lieberson 1969:852).

9. Multiplex ties for kin members and partners in the business were not great in this sample and were not more common for women. Only 13% of men named a kin alter as a partner, which was very similar to the 9% of women who did so.

10. The variable had a range of 0 to 200 and was slightly skewed, with a small number of high values. We corrected for skewness by logging the size of the network. However, logging it did not significantly change the results; therefore, for ease of interpretation we used the raw size of the network. The mean of 8.8 is reasonable, considering other findings of general network size by Fischer (1982) and Wellman (1992b). Their studies found a mean range of 11 to 17. Because our question was only about business networks, a lower mean is plausible.

11. Multivariate analyses regressing heterogeneity and proportion of kin on gender are not shown here.

12. We ran models that would test the interaction effects of gender with the other variables, curvilinear effects of age, and influence of industry. However, the interactions, curvilinear age effects, and industry were not significant and therefore were not included in the final model.

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