Chapter 6
Business Owner Demography, Human Capital, and Social Networks

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6.1 Introduction

While early work on the topic of entrepreneurship tended to portray entrepreneurs as heroic individuals (e.g., see Raines & Leathers, 2000, on Schumpeter's description), more recent perspectives have come to recognize that new business activity is often initiated by groups of startup owners. Starting in the late 1980s and early 1990s, a new generation of scholars in the entrepreneurship field called for a systematic program of research that would document the prevalence of startup teams, describe their properties, and assess their impact on business performance (e.g., Gartner, Shaver, Gatewood, & Katz, 1994; Kamm, Shuman, Seeger, & Nurick, 1990). In a review of developments in entrepreneur research and theory, Gartner et al. (1994) noted that "the 'entrepreneur' in entrepreneurship is more likely to be plural, rather than singular" (p. 6). They offered an expansive definition of startup teams, which included owners, investors, organizational decision-makers, family members, advisors, critical suppliers, and buyers as possible candidates for the role of "entrepreneur."

In this chapter, we focus on one of these candidate roles—that of the owner—in describing the demography and network structure of new business startups in the United States (subsequent chapters consider key nonowners and other helpers). Why do some startup owners go it alone, while others recruit spouses, kin, co-workers, friends, or even strangers to join them? What social processes impact the composition of entrepreneurial teams? To provide some preliminary insight on these questions, we begin with a theoretical overview of mechanisms that have been widely studied as affecting the formation and composition of entrepreneurial and management teams. Next, we turn to the quantitative information on solo startup owners and teams offered by the PSED II, paying particular attention to potential differences from both the general population and the PSED I, an earlier representative survey of

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nascent entrepreneurs. We also consider what changes can be observed among startup owners in the PSED II across waves, as some owners abandon their startup efforts and new owners are recruited to join existing teams. Finally, we address the timing of owner recruitment and the features of owner team structure that may impact the duration of group emergence.

6.2 Mechanisms Affecting Owner Team Formation

Following previous research on founding team formation (e.g., Ruef, Aldrich, & Carter, 2003), we discuss three general mechanisms that may influence the composition of owner teams: (a) *homophilous affiliation*, or recruitment on the basis of similarity in readily observed socio-demographic characteristics; (b) *functional diversification*, or recruitment on the basis of complementary (and nonoverlapping) competencies and expertise; and (c) *network constraint*, or recruitment on the basis of existing social ties, particularly those involving strong interpersonal bonds.[1] The first of these mechanisms is primarily social psychological in character, the second has been considered more so in strategic perspectives on entrepreneurial activity, and the third is drawn from a broad array of studies on group formation in structural sociology.

Homophilous affiliation refers to a tendency of individuals to collaborate based on shared socio-demographic characteristics. Although homophily can occur on the basis of similarity in values, beliefs, tastes, or other underlying dispositions (Lazarsfeld & Merton, 1954), visible social identities offer the simplest source of attachment to groups. Three processes help to explain the prevalence of homophily in organizational settings. First, individuals often assume that others who have a common social identity tend to think as they do, even if this perception results from a misattribution of shared understanding (McPherson, Smith-Lovin, & Cook, 2001). Second, the visible similarity of individuals also tends to dispose them toward a greater level of interpersonal attraction and trust, an idea referred to in some studies as the similarity-attraction principle (e.g., Boone et al., 2004). Third, the homophilous recruitment of colleagues can serve as a political mechanism to ensure loyalty and to perpetuate personal power.

Within established organizations, all three processes have been observed, contributing to what Kanter (1977)—studying male managers—famously referred to as "homosocial reproduction." Within entrepreneurial groups, the fine-grained qualitative or quantitative evidence required to adjudicate among these processes remains largely absent. In the aggregate, however, gender and ethnicity appear to be potent drivers of homophilous affiliation in founding teams (Aldrich & Ruef, 2006, pp. 72–73).

Functional diversification refers to a desire to seek out collaborators with diverse and complementary skills that lie beyond the abilities of an individual. Studies of functional diversification can be traced back to the 1950s, when a

host of experiments were deployed to analyze the process of role differentiation in small task groups (e.g., Slater, 1955). Within the entrepreneurship field, studies of functional diversity are more recent. Eisenhardt and Schoonhoven (1990) considered the impact of heterogeneity in industry tenure among founding team members on the growth of semiconductor manufacturing startups. They posited that growth would increase with functional heterogeneity, reflecting the ability of diverse entrepreneurial teams to avoid "groupthink" and elicit distinct contributions from members to solve the problems faced by startup enterprises. In his examination of functional diversity among the *Inc. 500* companies, Ensley (1999) offers a slightly different perspective. In contrast to Eisenhardt and Schoonhoven, he conceptualized team heterogeneity as having an *indirect* effect on performance and growth, mediated by cognitive and affective conflict within the group. On the one hand, team members with diverse skills were expected to evidence more debates and disagreements around ideas (*cognitive conflict*), a process that would ultimately lead to the formulation of better business strategies for new enterprises. At the same time, Ensley also hypothesized that skill diversity would be associated with frustrations directed at individual persons within the team (*affective conflict*), a process that could adversely impact consensus around common strategic goals.[2]

A third mechanism, that of *network constraint*, addresses how the formation and dynamics of social groups are limited by pre-existing social networks, particularly those that involve kinship, marital, or romantic relationships. It follows a well-established sociological literature that has called attention to the *embeddedness* of economic actors within social networks (Granovetter, 1985), but departs from this tradition in one notable respect. While much of the literature has argued for the "strength" of weak network ties in searches for job and business opportunities (Granovetter, 1995; see Mouw, 2003, for a critique) or in the strategic manipulation of structural holes (Burt, 1992), the perspective offered here is that the importance of strong network ties often trumps that of weak ties in an entrepreneurial context. This holds true for startup owner teams, in particular, because members have an enduring desire for trust, despite the instrumental advantages that may accrue from weak tie networks, in terms of structural autonomy or the acquisition of novel information.

When spatial or labor market constraints limit the availability of potential business partners, the three mechanisms also offer distinct explanations for solo entrepreneurship. Considering homophilous affiliation, for instance, we would expect to see more single-owner enterprises in neighborhoods where entrepreneurs are clearly in the demographic minority and, therefore, find it difficult to locate partners that conform to in-group biases. By the same token, the principle of functional diversification anticipates that single owner business startups become more likely when co-founders with complementary skills are hard to recruit, perhaps owing to tight labor market conditions. The mechanism of network constraint predicts that solo entrepreneurship will be especially

prevalent for owners who are unmarried, romantically unattached, and who do not have family members living nearby.

Homophilous affiliation, functional diversification, and network constraint need not be mutually exclusive. Nevertheless, an important question posed for studies of owner team structure is how these mechanisms may conflict with one another. The network constraints imposed by existing strong ties can lead to nepotism and "satisficing" recruitment decisions, rather than the creation of teams with diverse entrepreneurial knowledge or skills. When demographic characteristics are correlated with distinct dimensions of human capital, then the development of an owner team with a high degree of similarity in age, gender, or ethnicity will also contribute to a lack of functional heterogeneity. Homophily can undermine the role of strong network ties in the creation of founding teams—as may be the case when male owners prefer to collaborate with other males, rather than their spouses—and, conversely, social ties can mitigate in-group biases, as predicted by the extensive literature on the contact hypothesis (e.g., Allport, 1954; Pettigrew & Tropp, 2006).

6.2.1 Owner Team Questions in the PSED II

Items concerning the composition of owner teams can be found in sections G, H, J, and K of the PSED II. Table 6.1 summarizes the items asked in Wave A of individual owners with respect to owner demography, human capital, and interpersonal networks (note that owner contributions are addressed separately in Chapter 5 of this Handbook). Taken as a whole, these questions provide researchers with a valuable opportunity to explore the mechanisms of homophilous affiliation, functional diversification, and network constraint in a nationally-representative sample of social groups.

Two initial items—AG1 and AG2 (not shown in the table)—address the overall size of the business owner teams. AG1 asks whether the new business will only be owned by the respondent, by the respondent and the respondent's spouse, or by the respondent and some other people or businesses. AG2 elicits the total number of people, businesses, or financial institutions that will share ownership of the new business. In Wave A, subsequent items collected information for each respondent and up to four other owners within the nascent enterprise's founding team.

Question AG5 distinguishes between individual persons and representatives of institutional owners. The remaining information in the table was collected only for those business owners acting on their own behalf; institutional owners were addressed separately in section K of the PSED II ("Legal Entity Owners"). Items AH1 through AH6 provide information on the gender, age, ethnicity, marital status, and education of the business owners. The next three items (AH7–AH9) were only asked for owners aside from the respondent. Questions AH7 and AH8 consider the duration and nature of the relationship of all other

Table 6.1 Selected PSED II interview items for business owners, Sections G, H, and J (Wave A)

Summary of variable	Focal respondent	Other owners
Type of owner (person, institution)		AG5_*
Gender	AH1_1	AH1_*
Age	AH2_1	AH2_*
Hispanic/Latino	AH3_1	AH3_*
Non-Hispanic ethnicity	AH4x_1	AH4x_*
White (x = 'a') Black/African American ('b') American Indian ('d') Asian ('e') Pacific Islander ('f') Other ('z')		
Marital status/living arrangements (married, living with partner, separated, divorced, widowed, never married)	AH5_1	AH5_*
Education (up to 8th grade, some HS, HS degree, technical degree, some college, community college, bachelors, some graduate, masters, doctoral)	AH6_1	AH6_*
Years they have known respondent		AH7_*
Relationship with respondent (spouse, cohabiting partner, cohabiting relative, other relative, co-worker, other acquaintance / friend, stranger, non-cohabiting partner)		AH8_*
Month and year they became involved in business	[AA8]	AH9_*
Occupation (3-digit code, 2000 census classification)	AH10_1	AH10_*
Years of experience (in same industry as startup)	AH11_1	AH11_*
Other businesses started (#)	AH12_1	AH12_*
Other businesses owned (#)	AH13_1	AH13_*
Relationship with other owner (non-respondent)		AJ2_**

* varies from 2 to 5 to accommodate other owners; ** varies from 23 to 45 to accommodate all possible (symmetrical) dyads among other owners. Items for ethnic identification are not mutually exclusive.

owners to the respondent. Question AH9 identifies the month and year that those owners became involved in the business venture (for the focal respondent, this can be inferred from an earlier question, AA8). Other items in section H apply to both respondents and other owners, identifying their occupation, industry tenure, number of startups, and number of other businesses owned (items AH10–AH13).

The information on social relationships included in section H is limited to interpersonal networks involving the focal respondent. In section J, the respondents were also questioned about the relationship between all of the other owners they had identified. By combining these sets of items, a complete image of the social network within each nascent startup can be constructed.

The items on owner demography, human capital, and networks were generally developed with an eye toward comparison with questions in the PSED I.

In the descriptive statistics below, we tabulate figures for the first wave of each panel study and note topics where differences in operationalization may lead to issues of comparability.

6.2.2 *Characteristics of Startup Owners*

The demographic characteristics and human capital of business startup owners are summarized in Table 6.2, considering data from the first waves of both the PSED I (1998–2000) and PSED II (2005–2006). The overwhelming majority of owners (97–98%) in both surveys are individuals working on their own behalf, as opposed to representatives of businesses, financial institutions, government agencies, or other legal entities. While much of the management literature has called attention to the active role of venture capital firms and other financial intermediaries in entrepreneurial activity, they are not numerically prevalent as owners in general samples of nascent enterprises. In 2005–2006, for instance, PSED II estimates suggest that existing businesses (or their representatives) account for 1.8% of all startup owners, banks account for 0.7%, and venture capital firms only include 0.3% of owners. Moreover, in almost 50% of those cases where an organization does serve as an owner, its representatives have no active decision-making or advisory role in the startup where it holds an equity stake.

The attributes of individual owners reflect some of the diversity of the American population. Relative to the population as a whole, women are under-represented among startup business owners and minorities (particularly, African Americans) are over-represented. Business owners are less likely to have been employed in management or professional occupations and are more likely to have a bachelor's or advanced degree than members of the general population. Marriage rates among owners of startup businesses are slightly less than those observed more generally among adults in the United States.[3]

As reflected in the statistical comparison of the PSED I and II samples, the characteristics of business owners have been fairly stable across time. There is no indication that the demographic composition (with respect to gender, age, or ethnicity) of startup owners has changed significantly, nor has there been any general shift in human capital (considering industry and startup experience).[4] In both the context of the startup boom period of the late 1990s and the less euphoric environment several years later, the "average" owner of a new business enterprise was a 39-year-old white male, with roughly 7–8 years of work experience in the same industry as his startup and a history of one previous startup effort.

There is some indication of a shift over time in the occupational background of owners. In the PSED I, owners of nascent enterprises were more likely to have a professional or technical background. Detailed occupational statistics

Table 6.2 Descriptive statistics for individual owners: Panel Study of Entrepreneurial Dynamics, I (1998–2000) and II (2005–2006)

		PSED I		PSED II		Significant
Variable	Response	Cases	Weighted %/ mean	Cases	Weighted %/ mean	sample difference?
Type	Person	1,446	97.8	2,038	96.7	No
	Institution		2.2		3.3	
Gender	Male	1,419	63.0	1,981	62.6	No
	Female		37.0		37.4	
Age	(Years)	1,381	38.7	1,962	39.3	No
Ethnicity[1]	White	1,367	71.5	1,957	71.4	No
	Black		16.5		18.3	No
	Hispanic		8.1		6.4	No
	Asian/Pacific		2.1		1.3	No
	Other		1.8		2.6	No
Industry tenure	(Years)	1,413	8.2	1,958	7.2	No
Other startups	(Count)	1,379	1.3	1,946	0.9	No
Occupation	Professional	1,351	27.7	1,965	20.3	$p < 0.01$
	Administrative		26.6		26.0	No
	Sales/service		19.0		21.0	No
	Production		19.0		20.2	No
	Other[3]		7.6		12.6	$p < 0.01$
Education[2]	No HS degree	815	2.6	1,962	5.4	$p < 0.01$
	HS degree		17.5		23.7	$p < 0.01$
	Some college[4]		41.3		34.7	$p < 0.01$
	BA/BS		23.9		23.0	No
	Postgraduate		14.7		13.2	No
Marital Status[2]	Married	813	55.6	1,971	53.3	No
	Never married		18.0		23.1	$p < 0.01$
	Cohabiting		11.6		11.0	No
	Other[5]		14.8		12.6	No

[1] Due to changes in operationalization, statistics for ethnicity may not be strictly comparable in the PSED I and II. "Other" category includes Native American, mixed ethnicity (non-Hispanic and non-White), and other (unspecified). "Hispanic" category refers to non-white Hispanics.
[2] Statistics for PSED I limited to respondent only.
[3] Includes students, homemakers, retirees, the self-employed, and the unemployed.
[4] Includes vocational and community college degrees.
[5] Includes separated, divorced, or widowed.

reveal that some of this shift can be accounted for by the greater prevalence of computer scientists and kindred workers (e.g., system analysts, programmers, etc.) among startup owners during the period of the dot-com boom. Specifically, around 4% of all owners had a professional background in a computing field in 1998–2000; by 2005–2006, that number had dropped to 1.8%.[5] Compensating for this decline, homemakers, students, and the unemployed were increasingly likely to become owners of business startups, representing 7.5% of all owners in the PSED I, but 9.5% of the total in the PSED II. These trends

suggest a declining technical barrier-to-entry for nascent startups, particularly among businesses that rely heavily on electronic commerce.

To some extent, a declining barrier-to-entry is also apparent in the educational credentials of business owners. In 1998–2000, around 80% of all startup owners had some education beyond the level of a high school diploma. By 2005–2006, this number had decreased to 71% of startup owners. Consistent with the shift in occupational demography, this trend may reflect the lower technical threshold that some individuals now face in becoming entrepreneurs, especially in the field of internet-based selling.[6] Alternatively, it may also reflect the increasing labor market disadvantage of job-seekers without a post-secondary education, a trend that can contribute to "survivalist" entrepreneurship in tight labor markets (cf. Boyd, 2000). Like the findings for changes in the occupational background of entrepreneurs, the statistical significance of these trends should be subjected to further scrutiny. By applying multiple two-sample tests to categories within a single nominal variable, the statistics in the table are likely to overstate change over time.

A final difference between the 1998–2000 and 2005–2006 samples involves marital status. In the PSED II data, startup owners were significantly less likely to ever have been married. While this does not have any immediate bearing on the composition of entrepreneurial groups, it does raise questions as to whether startup businesses have lowered their reliance on spousal or intimate ties and, more generally, whether entrepreneurs are more likely to pursue business ventures on their own.

These questions can be pursued directly by examining the socio-demographic composition of teams of startup owners, as summarized in Table 6.3. The size distribution of these teams is highly skewed, with roughly half of all nascent startups involving only a single owner, more than a third involving two owners, 7% with three owners, and only a handful (c. 3%) featuring five or more business owners. Restricting attention to the enterprises with more than a single owner, we see that the majority are mixed gender teams, but that another substantial percentage (nearly 30%) are comprised solely of men. The tendency toward demographic homogeneity is more striking in the case of ethnicity, with 86% of all teams in the PSED II sample falling exclusively into one of the five ethnic categories noted in Table 6.2. Diversity within the owner teams is primarily evident in the case of occupational composition. The majority of multi-owner teams (nearly 72% in the PSED II) draw on more than one of the major occupational categories, thereby mixing professional, administrative, service, production, or other skills.

Relationships within the teams of startup owners are enumerated in a simple (dichotomous) fashion in the table. Despite the apparent increase in entrepreneurs who have never been married (cf. Table 6.2), intimate ties remain an important bond within entrepreneurial groups. Over half of all multi-owner teams include at least one couple who are either married or co-habiting. About a fifth of the owner teams rely on other kinship ties, including both affinal and consanguineal relationships. Teams with former co-workers are slightly less

Table 6.3 Descriptive statistics for teams of owners: Panel Study of Entrepreneurial Dynamics, I (1998–2000) and II (2005–2006)

		PSED I		PSED II		Significant
Variable	Response	Cases	Weighted % / mean	Cases	Weighted % / mean	sample difference?
Size	One owner	830	47.1	1,214	51.2	No
	Two owners		38.3		35.0	No
	Three owners		7.0		7.1	No
	Four owners		4.2		4.0	No
	Five + owners		3.4		2.7	No
Gender composition[1]	Mixed gender	412	63.2	557	65.0	No
	All male		29.7		29.3	No
	All female		7.1		5.7	No
Age[1]	(Standard deviation)	385	5.4	553	5.2	No
Ethnic composition[1]	Single ethnicity	381	84.5	534	86.0	No
	Multiple ethnicities		15.5		14.0	
Industry tenure[1]	(Standard deviation)	411	5.2	547	5.2	No
Other Startups[1]	(Standard deviation)	395	0.9	542	0.7	No
Occupational composition[1]	Single occupational class	376	26.8	551	28.3	No
	Multiple occupational classes		73.2		71.7	
Relational composition[2]	With spouses/live-in partners	412	54.7	586	51.5	No
	With nonspouse family member		18.0		19.6	No
	With business associates		20.2		16.4	No
	With other friends/ associates		25.1		24.5	No

Size distribution includes individuals who are not acting on their own behalf (representing a business, bank, or other legal entity). All other statistics are limited to autonomous individuals.

[1] Excludes single-owner firms or firms that only have relevant data for a single owner.

[2] Indicates whether relationship is present for *any* pair of owners. Excludes single-owner firms.

common (16% in the PSED II), while those with friends or acquaintances who have not worked together are slightly more common (25%). Notably, there are *no* teams of owners that *only* involve collaborations among strangers (with no prior ties before initiating the startup effort) among the nascent businesses surveyed in 2005–2006.

The trend over time in the owner teams can be summarized very succinctly—there is no evidence of any significant change in the composition of teams formed in 1998–2000 and those formed in 2005–2006. Considered in the aggregate, the size distribution, demographic composition, and relational

composition of these teams are statistically equivalent for the measures noted in Table 6.3. There is also a remarkable level of stability for within-team variation in human capital, as measured by industry tenure and prior startup experience. Despite dramatic changes in the economic context of the late 1990s and that of 2005–2006, these statistics hint that the underlying mechanisms of entrepreneurial group formation may be relatively similar across the two periods.[7]

Based on these descriptive statistics, some readers may be tempted to make more precise inferences regarding the mechanisms that lead to the formation of entrepreneurial groups. For instance, the high level of ethnic homogeneity among owner teams may be taken as an indication of a strong in-group bias along this demographic dimension, with white entrepreneurs preferring to collaborate with other whites, African-American entrepreneurs preferring other blacks, and so forth. By contrast, the lower level of homogeneity observed for the occupational composition of teams may be taken to suggest that functional diversity also plays a role in collaboration among business co-owners. Although these mechanisms are theoretically plausible, it should be cautioned that their existence cannot be intuited from our descriptive data alone, for several methodological reasons. First, the aggregate descriptions of owner team composition do not take any account of the marginal distribution of business owner characteristics, as shown in Table 6.2. Considering ethnic composition, for example, the relatively large proportion of white business owners in these samples yields a considerable amount of homogeneity, even in the absence of in-group bias. Thus, one would expect the majority of owner dyads (51%) to consist of two white entrepreneurs under conditions of random mixing ($p = 0.714 \times 0.714$). Second, statistical expectations regarding owner team composition also depend on group size. In the absence of an in-group bias, the expected percentage of teams that are exclusively white drops to 36% for three owners ($p = 0.714 \times 0.714 \times 0.714$), 26% for four owners, and 18.5% for five owners. Finally, these univariate statistics do not account for other factors that may contribute to group homogeneity or heterogeneity along some dimension. It is plausible, for instance, that ethnic homogeneity among these owner teams is at least partially attributable to the reliance of entrepreneurs on kinship ties and that occupational diversity may be reduced, in part, when business owners recruit former co-workers as startup participants.

While a more nuanced examination of the mechanisms of owner team composition lies beyond the purview of this handbook chapter, results from multivariate models of group structure can be summarized briefly (see Ruef, 2002, for further details on methodology). Relative to a model of random mixing, the level of ethnic homogeneity observed among owners in the PSED II is extremely high—around 120 times random expectations for white owners and 383 times expectations for minorities (Ruef, in press, chap. 3); rates of in-group bias among men, women, professionals, and nonprofessionals also exceed random expectations, but by a much lower amount (with odds ratios ranging from 2 to 6). Some of these tendencies toward homophilous affiliation, particularly gender in-group bias, are sensitive to the inclusion of controls for

strong network ties within the owner teams (unsurprisingly, the presence of spousal or cohabitation relationships dramatically increases gender heterogeneity). Similar results for the PSED I (see Ruef et al., 2003) suggest that homophilous affiliation on the basis of ethnicity and gender is a strong and stable propensity in owner founding teams, that functional diversification is limited, and that network constraints from relationships with strong ties have a pronounced impact on owner group composition.

6.3 Changes in Owner Team Composition Over Panel Waves

Given the remarkable stability of the demographic and human capital characteristics of startup owners between the PSED I and II, we would expect to find few statistically significant changes in team composition between the two waves of the PSED II, collected one year apart. The descriptive statistics presented in Table 6.4 support this prediction. Two-sample proportion tests comparing the characteristics of teams that took part in both waves of the study do not reveal any statistically significant compositional shifts. Although 8.2% of the teams lost at least one owner between the two waves and 4.3% recruited new owners, the turnover does not appear to have had a major impact on the teams' aggregate characteristics.

A number of small differences between the two waves do exist, though we cannot rule out that they result from essentially random variations. The team size distribution in both waves is positively skewed but becomes slightly more peaked in Wave B, with the proportion of single-owner teams increasing from 50.9 to 52.9% (which corresponds to a decline in mean team size from 1.7 to 1.6). This change, along with the net loss of owners in the sample as a whole, may be an early indicator of team decline resulting from the "liability of newness" (Stinchcombe, 1965). Those entrepreneurial projects that fail to achieve their objectives in the first few months of operation may begin losing members, leaving behind only those most committed to the enterprise. It appears that such decline is not offset by growth among successful teams in our sample.

Minor changes can also be observed in the demographic composition of the startup teams. The proportion of mixed gender and all-male teams declines between the waves, while the proportion of all-female teams increases from 4.8 to 7.0%. Teams in Wave B are less diverse in terms of ethnicity but more diverse in terms of age. The proportion of friend and acquaintance ties among the nascent entrepreneurs declines by 3.1 percentage points (from 20.4 to 17.3%), while the proportion of spousal, kin, and business ties increases.

Owing to sample attrition, the data used for the cross-wave comparisons consist of 473 fewer startup firms than the complete Wave A sample summarized in Table 6.3. However, the results of a series of two-sample tests, which are reported in Table 6.4, suggest that the 741 firms in the reduced sample do not differ significantly from the 1,214 teams in the full sample. Consequently,

Table 6.4 Changes in owner team statistics based on sample attrition: Panel Study of Entrepreneurial Dynamics II, Waves A (2005–2006) and B (2006–2007)

		PSED II Wave A		PSED II Wave B			
Variable	Response	Cases	Weighted % / mean	Cases	Weighted % / mean	Significant sample difference? (Wave A remaining vs. full)	Significant sample difference? (Wave A vs. B)
Size	One owner	741	50.9	741	52.9	No	No
	Two owners		37.1		36.7	No	No
	Three owners		5.8		5.7	No	No
	Four owners		3.9		3.0	No	No
	Five + owners		2.4		1.7	No	No
Gender composition[1]	Mixed gender	341	68.4	346	66.5	No	No
	All male		26.8		26.4	No	No
	All female		4.8		7.0	No	No
Age[1]	(Standard deviation)	338	5.0	327	5.2	No	No
Ethnic composition[1]	Single ethnicity	331	86.5	320	87.5	No	No
	Multiple ethnicities		13.5		12.5		
Industry tenure[1]	(Standard deviation)	335	6.1	325	6.1	No	No
Other startups[1]	(Standard deviation)	331	0.7	322	0.7	No	No
Occupational composition[1]	Single occupational class	336	28.4	326	28.4	No	No
	Multiple occupational classes		71.6		71.6		
Relational composition[2]	With spouses/live-in partners	361	57.9	346	58.8	No	No
	With nonspouse family member		18.9		19.3	No	No
	With business associates		14.9		16.3	No	No
	With other friends/associates		20.4		17.3	No	No

Size distribution includes individuals who are not acting on their own behalf (representing a business, bank, or other legal entity). All other statistics are limited to autonomous individuals.

[1] Excludes single-owner firms or firms that only have relevant data for a single owner.

[2] Indicates whether relationship is present for *any* pair of owners. Excludes single-owner firms.

sample attrition does not appear to systematically bias the demographic composition or human capital of the owner teams.

Thus far, we have examined turnover within entrepreneurial teams by comparing aggregate team attributes at two points in time. However, this approach does not give us insight into the particular characteristics of the lost and recruited owners nor of teams that have been affected by member turnover. In order to better understand changes in team composition, we must combine individual-level data, including variables that flag lost and recruited owners, with data on team-level attributes. Table 6.5 shows the exploratory results of such an analysis.

The first column of the table lists the individual-level variables that describe the owners who have left and joined the sample. The second column contains the team-level variables which have been cross-tabulated with the owner characteristics. In addition to sample sizes and weighted percentages, the table reports the expected percentage for each cell of the table along with a p-value from a two-sample proportion test. The analysis includes data from Wave A for all firms that were reinterviewed in Wave B, including single-owner enterprises.

Of the 1,209 owners (including respondents and others) present in the reduced Wave A sample, 57 left the startup firms prior to the Wave B reinterviews. In the same time period, 29 new owners were recruited, for a total of 1,181 owners in Wave B. Of the latter, 60.5% joined single-owner teams and 39.5 joined multiple-owner teams. This proportion was not significantly different from what one would expect based on the marginals in the sample. The same is true of the distribution of male owners who left mixed-gender (69.3%) and all-male (30.7%) startups. However, new male owners recruited between Waves A and B joined all-female teams in disproportionately high numbers (10%) but were under-represented among teams that had already been composed of both genders (15.8%). Of the male recruits, 74.2% joined all-male teams, which was not significantly different from the expected proportion. This finding suggests that gender homophily continues to play an important role for men in the early stages of startup formation, while firms owned by women may become more gender-diverse. Whether this choice is dictated by preference or by perceived necessity is an important empirical question, but one that is outside of the scope of this chapter. The loss of female owners, much like that of their male counterparts, does not differ significantly from the expected distribution. The recruitment of women follows a different path: a large proportion of new female owners join all-male teams, while considerably fewer join mixed-gender or all-female teams. However, this result should be viewed with caution, given the very small number of female recruits in the sample ($N = 7$).

Small sample size also poses a problem for interpreting the breakdown of lost and recruited owners by ethnicity. African American entrepreneurs seem to withdraw disproportionately from mixed-ethnicity teams, which could stem from negative experiences with owners from other ethnic backgrounds (in contrast, the majority of those recruited join all-black firms). However, given that only seven black owners leave the sample and only four join it, such conclusions are

Table 6.5 Owners who joined or left teams between waves: Panel Study of Entrepreneurial Dynamics II (2005), Waves A and B

		Owners lost				Owners recruited				
Owner variable	Team composition (Wave A)	Number of cases	Weighted % / mean	Expected %	Significant difference?	Number of cases	Weighted % / mean	Expected %	Significant difference?
All owners	Single-owner teams[1]	57	0.0	0.0	–[2]	29	60.5	50.9	No
	Multiple-owner teams		100.0	100.0			39.5	49.1	
Gender: Male	Mixed-gender teams	42	30.7	38.9	No	22	15.8	38.9	<0.05
	All-male teams		69.3	61.1			74.2	61.1	No
	All-female teams		0.0	0.0			10.0	0.0	<0.001
Gender: Female	Mixed-gender teams	15	61.4	55.2	–	7	5.7	55.2	–
	All-male teams		0.0	0.0			78.1	0.0	
	All-female teams		38.57	44.8			16.1	44.8	
Age	All teams	57	43.7	41.2	No	29	37.9	41.2	No
Ethnicity: White	Single-ethnicity teams	41	87.2	94.2	No	23	87.7	94.2	No
	Mixed-ethnicity teams		12.8	5.9			12.3	5.9	
Ethnicity: Black	Single-ethnicity teams	7	18.6	87.5	–	4	100.0	87.5	–
	Mixed-ethnicity teams		81.4	12.5			0.0	12.5	
Ethnicity: Hispanic	Single-ethnicity teams	6	64.9	79.2	–	0	0.0	–	–
	Mixed-ethnicity teams		35.1	20.8			0.0	–	
Industry tenure	All teams	56	9.7	8.2	No	28	8.1	8.2	No
Other startups	All teams	53	1.1	0.9	No	28	0.9	0.9	No
Education: less than BA	Highest level: less than BA	36	68.0	74.8	No	12	65.7	74.8	–
	Highest level: BA or higher		32.0	25.3			34.3	25.3	
Education: BA or Higher	Highest level: less than BA	19	0.0	0.0	No	2	0.0	0.0	No
	Highest level: BA or higher		100.0	100.0			100.0	100.0	

All statistics include single-owner firms.
[1] 1.0% of all teams both lost *and* recruited owners between Waves A and B.
[2] Tests for sample differences not carried out due to small sample size.

speculative at best. Among a similarly small sample of Hispanic owners ($N = 6$), 64.9% exit single-ethnicity teams, which is consistent with the expected distribution. White owners who leave ($N = 41$) and join ($N = 23$) the startups also do so in similar proportions to what one would expect based on the full sample marginals.

The mean age of owners who leave firms is slightly higher than that of the full sample: 43.7 years compared to 41.2 years. In contrast, newly recruited owners tend to be younger, with an average age of 37.9. However, neither difference is statistically significant. The younger age of the recruits may partly explain their shorter average industry experience. Owners who leave the sample have an average of 9.7 years of experience, while those who join it have an average of 8.1 years (compared to a full sample mean of 8.2 years). The same logic may also explain differences in prior entrepreneurship experience: on average, owners who leave the sample have helped start 1.1 businesses, while the figure for new recruits is 0.9 (compared to a full sample mean of 0.9).

Finally, owners who do not possess a bachelor's degree are somewhat more likely to leave teams co-owned by members who hold a B.A. or graduate degree (32%) than one would expect based on the marginals (68%). Still, the proportion of newly recruited owners with less than a B.A. who join these teams is quite similar (34.3%). Given that only two newly recruited owners have a bachelor's degree, the data do not allow us to draw conclusions about the role played by functional diversification in the turnover of startup owners.

6.4 Time Taken to Organize the Owner Team

A final analysis considers how long entrepreneurs take to organize their owner teams, based on the lag time between the date of initial owner involvement and the date of the last owner's recruitment (Table 6.6). To minimize sample attrition, attention here is limited to Wave A of the PSED II. As suggested by the preceding analyses, the number of cases where new owners are recruited to (or leave) these business startups between the two waves is relatively small. Moreover, the overall median lag time for multi-owner team formation in Wave B of the PSED II is identical to that observed in Wave A (2 months).

The descriptive results in the table suggest several differences in the median organizing times depending on owner team composition. Predictably, the duration of team formation rises monotonically with the number of owners, from just a single month (on average) for two-owner teams to nearly a year for teams with five or more owners. There is also some indication that the involvement of institutional owners adds to this phase of the startup process, with the median lag time for new ventures with institutional owners being triple that of ventures without institutional involvement. Notably, this difference is observed even though the majority of institutional owners already have an existing business or personal relationship with these nascent entrepreneurs, rather than being contacted via formal applications, referrals, or other means.

Table 6.6 Median time required to recruit all owners (from date of initial owner involvement): Panel Study of Entrepreneurial Dynamics II (2005–2006), Wave A

Variable	Sub-category	Median (months)	Significant difference?
(Overall sample)		2	–
Size	Two owners	1	$p < 0.001$
	Three owners	3	
	Four owners	7	
	Five + owners	11	
Institutional owners	None	2	$p < 0.05$
	Some	6	
Gender composition	Mixed gender	2	No
	All male	3	
	All female	1	
Ethnic composition	Single ethnicity	2	$p < 0.01$
	Multiple ethnicities	6	
Occupational composition	Single occupational class	2	No
	Multiple occupational classes	2	
Relational composition[1]	Without spouses/live-in partners	3	$p < 0.05$
	With nonspouse family member	6	$p < 0.001$
	With business associates	1	No
	With other friends/associates	4	$p < 0.05$
Sample size		$N = 555$	

All statistics exclude single-owner firms. Statistical significance of timing differences is evaluated over sub-categories within variables using non-parametric tests (Mann–Whitney test for two sub-categories, Kruskal–Wallis test for three or more).
[1]Tests of timing differences are conducted with respect to a reference category in which a particular relationship is present (spouses/live-in partners) or absent (all other relations).

A demographic analysis reveals some variation in the duration of owner team formation. All-female owner teams appear to take slightly less time to become organized than mixed-gender teams, which, in turn, take slightly less time than all-male teams. These differences, however, are not statistically significant. More dramatic is the gap between homogeneous ethnic groups, which average two months for team formation, and heterogeneous ethnic groups, which average half a year. The reasons for this gap are difficult to infer from simple bivariate associations. Respondents in the PSED II report that the amount of time they have known co-ethnic partners (mean of 18.9 years) is substantially higher than the amount of time they have known partners who do not share their ethnic identity (10.1 years, $t = 5.22$, $p < 0.001$). One plausible explanation, then, is that co-ethnic owners require less time to develop the trust needed to secure mutual involvement in a business venture, owing to higher levels of a priori familiarity. Alternatively, one might posit that the increased lag time in heterogeneous teams reflects an in-group bias, in which entrepreneurs

first approach potential co-ethnic partners for their business ventures and, when faced with a lack of enthusiasm among co-ethnics, only later turn to business partners that do not match their ethnic background.

The table also offers estimates of the effect of social network characteristics on the duration of owner team formation. The involvement of spouses or cohabiting partners appears to accelerate the process of team formation slightly (two month median duration versus three months for owner teams without this relational tie). This cannot be taken to imply that the existence of intimate ties within the owner teams is generally correlated with rapid recruitment. Teams involving kinship relations appear to require relatively long to form, while those among former co-workers emerge quickly. The duration of team formation among owners with ties of friendship or acquaintanceship outside the workplace lies between these two extremes.

As in the case of aggregate figures on the structure of owner teams, some caution should be employed in interpreting these descriptive statistics. The calculated duration of owner team formation is sensitive to the problem of *right-censoring*—i.e., the possibility that more owners could be recruited to any given startup after the interview date and that the "end" of team formation is not truly observed in these cases. In addition, none of the statistics reported in Table 6.6 control for other variables and should therefore not be taken as a basis for causal inferences.

6.5 Discussion

Data on owner teams in the PSED II offer researchers a rare opportunity to observe the extent of stability in group formation over time, addressing the degree to which processes such as homophilous affiliation, functional diversification, and network constraint continue to impact the way that entrepreneurs become linked to one another. Our descriptive results are consistent with the intuitions that in-group biases by ethnic identity strongly affect the formation of owner teams in the United States and that a majority of entrepreneurial groups are constructed on top of pre-existing networks, particularly those involving spouses or live-in partners. Not only are these owner teams more numerically prevalent than other entrepreneurial groups, but they also appear to form more rapidly. There is less clear evidence in favor of the claim that startup owners seek (or are able to achieve) functional diversification in affiliating with other entrepreneurs. However, all of these results should be viewed as preliminary and subject to further investigation with multivariate models of group composition (e.g., Ruef, 2002; Ruef et al., 2003).

Considered in historical context, the changes observed in owner team characteristics between the PSED I and PSED II are remarkably limited. While one survey was conducted during the heart of the "startup boom" of the late 1990s and the other was conducted in the midst of a developing credit crisis, these

environmental changes do not seem to have had much impact on the fundamental features of entrepreneurial group formation, either with respect to size, demography, human capital, or interpersonal networks. Within the PSED II panel itself, there is also very little change in owner characteristics between the first two waves (2005–2006 and 2006–2007). Few owners have left the nascent businesses that remain in the sample and fewer still have been recruited as new owners between survey waves.

In conclusion, we will acknowledge a number of data limitations that affect the analysis of owner demography and networks in the PSED II. Perhaps the most salient is that all compositional features of owner team demography and networks are based on the reports of a single entrepreneur. Prior work on perceptions of social network structure have suggested that there can be considerable variation on socio-metric observations between individuals within entrepreneurial organizations; moreover, accuracy in cognition appears to be correlated with interpersonal power in such contexts (Krackhardt, 1990). As a consequence, measurement error in the PSED II network module may be high when these items are elicited from owners who lack much influence in the startup process.

A parallel caveat applies to the application of demographic categories, especially ethnicity. When predictions regarding group processes are dependent on the *self-categorization* of entrepreneurs, then only the respondent's answers to the demographic items serve as valid measures of personal identity. This is especially true for studies that anticipate that in-group biases will be influenced more by internalized perceptions of group membership, rather than externally ascribed status characteristics (see Oldmeadow et al., 2003).

Despite these limitations, the PSED I and II offer a unique resource for researchers that seek to understand the demographic and network composition of business owner teams in the United States. Arguably, these are the only data sets that offer a nation-wide, representative sample of small groups and isolates involved in a common type of social activity. Future scholarship should unpack in greater detail how different mechanisms of group formation (homophily, functionality, and networks) interact in this context, how these processes unfold over time, and what impact they have on metrics of efficacy and fairness within entrepreneurial groups.

Notes

1. Other mechanisms reviewed in the literature, such as *status-driven recruitment* (the effort of entrepreneurs to affiliate with high-status alters) or *ecological constraint* (the limitations imposed by the number of available entrepreneurial partners in the same region or industry), will not be addressed here (see Ruef et al., 2003, for further discussion).
2. Like some of the recent work on top management teams (e.g., Boone et al., 2004), these conflicting processes lead to ambiguity as to whether startup teams will *evolve* to become more functionally diverse, even in the face of environmental pressures. Our discussion of owner turnover and recruitment over time, below, sheds some preliminary light on this issue.

3. For one basis of comparison, see the *Statistical Abstract of the United States* (US Department of Commerce, 2008), Tables 6, 55, 217, and 598.
4. Some caution should be observed in comparing the statistics for ethnicity in the PSED I and PSED II data sets. The former survey relies on a mutually exclusive categorization of owners' ethnic identity, while the latter allows respondents to select as many categories as they feel are appropriate. Comparisons are sensitive to the treatment of multi-ethnic owners.
5. For purposes of calculating these statistics, "computing professionals" are defined as individuals with a three-digit occupational code ranging from 100 ("computer scientists and systems analysts") to 111 ("network systems and data communication analysts"), using the 2000 Census schema.
6. The PSED II data suggest that the proportion of startup owners with a high school education (or less) who are involved in internet or direct selling is equal to that of owners with an education beyond the high school level (z-test statistic = 0.57, no significant difference).
7. A comparison of the PSED I statistics in Table 2 with previously published descriptive findings (e.g., Ruef, Aldrich, & Carter, 2003: Table 2) may appear to indicate some minor discrepancies. These differences result entirely from two methodological considerations: (1) previously published results tend to use slightly more restrictive sampling criteria (e.g., removing cases in which legal entities will own more than 50% of a startup venture); and (2) the number of cases reported within the tables in this chapter are always unweighted.

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