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Entrepreneurship ecosystems and women entrepreneurs: a social capital and network approach

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Abstract This study investigates the effects of venture typology, race, ethnicity, and past venture experience on the social capital distribution of women entrepreneurs in entrepreneurial ecosystems. Social network data from two municipal ecosystems in Florida, USA (Gainesville and Jacksonville), suggest that network connectivity and the distribution of social capital are significantly different for men and women entrepreneurs. This difference is contingent on the venture type. Male entrepreneurs show higher comparative scores of bridging social capital in aggressive- and managed-growth venture networks, while women entrepreneurs surpass their male counterparts' bridging capital scores in lifestyle and survival venture networks. Lastly, experienced women entrepreneurs that self-identified as white showed a higher degree of network connectivity and bridging social capital in the entrepreneurial ecosystem than less experienced non-white female entrepreneurs. Implications for entrepreneurship practice and new research paths are discussed.

Keywords Women entrepreneurs · Entrepreneurial ecosystems · Social capital · Boundary conditions of social capital · Network analysis

JEL classification L26 · L25

1 Introduction

Entrepreneurial (eco)systems have become a popular topic of discussion among scholars and policy makers. These discussions have led to the development of different conceptualizations with a collection of interrelated parts. For example, Isenberg (2010) constructs entrepreneurial ecosystems around nine elements such as cultural change and the reformation of regulatory frameworks. Neck et al. (2004) emphasize the importance of incubator organizations, universities, and support services to generate a constant flow of new ventures. Spigel (2017) and Stam (2015) have further built on these studies, detailing the function and linkage of each component. A commonly listed feature of all these ecosystem archetypes is their ability to support the formation of social capital between networks of stakeholders. Defined as the "sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and

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recognition" (Bourdieu and Wacquant 1992, p. 119), social capital is an important theoretical perspective to better understand the social stratifications in an entrepreneurial ecosystem. This is particularly relevant in high-growth venture environments, where women entrepreneurs are facing barriers to access network resources such as mentors, investors, or advisors (Carter et al. 2003).

Although work on female entrepreneurs' social capital has increased steadily over the years (Neergaard et al. 2005; Yetim 2008), many questions remain with respect to entrepreneurial ecosystems. To address some of these questions, our study conceptualizes entrepreneurial ecosystems as a social network of stakeholders with reciprocal ties. This allows us to examine the presence of distinct social clusters based on individual and venture characteristics as well as how social capital is distributed between male and female stakeholders.

To provide regional context, we selected the metropolitan areas of Gainesville and Jacksonville, in Florida. Gainesville's ecosystem is a prime example for a university-based entrepreneurial ecosystem that provides a broad stream of intellectual property, creating various opportunities for new technology-driven ventures. The extensive infrastructure of support programs and organizations such as accelerators or incubators further supports university graduates to start their entrepreneurial career. Jacksonville's ecosystem is driven by a diverse set of firms with respect to size and industry. The large geographic and demographic area provides opportunities for new ventures that serve business-to-consumer as well as business-to-business markets. A sizable number of business associations targeting underserved groups provide female and minority entrepreneurs with the opportunity to connect and build social capital.

The paper is organized in five sections. We start with a presentation of the theoretical background on social capital in entrepreneurship and entrepreneurial ecosystems. This is followed by a review on the effects of gender, venture type, race, ethnicity, and past venture experience on boundaries of social capital and networks. We then present our hypotheses and conceptual model. This is followed by the description of our study context, design, sampling, and methodology. In the results section, we elaborate on our descriptive data and hypotheses. The discussion section presents our main theoretical and empirical contributions followed by an acknowledgment of the limitations of this study and a summary of future research directions.

2 Theoretical background

2.1 A social capital perspective of entrepreneurship and entrepreneurial ecosystems

Entrepreneurship, and the process of starting new ventures, is a specific context that has been beneficiating from the steady increase of scholarly work on social capital since the 1980s (Adler and Kwon 2002). This early work has helped establish the notion of entrepreneurs as socially embedded agents who leverage vital resources such as financial assistance, industry knowledge, social support, or trust (Cope et al. 2007; Westlund and Bolton 2003) from their social environment to develop and grow their ventures (Baron and Markman 2000). Since then, research in entrepreneurship has steadily increased to examine the influence of social capital on venture performance (Bosma et al. 2004; Florin et al. 2003) and creation (De Carolis et al. 2009), performance of corporate strategic initiatives (Lechner et al. 2010), crowdfunding (Colombo et al. 2015), networking capital (Anderson and Jack 2002), and innovation of regional knowledge-intensive clusters (Whittington et al. 2009). Despite the plethora of new studies, social capital theory remains complex with a variety of dimensions (hierarchy, frequency, homogeneity), levels (individual versus aggregate), and definitions (Bourdieu 1986; Coleman 1988; Putnam et al. 1994). Social networks offer a promising avenue to address this miasma. They are defined "as a set of nodes (e.g., persons, organizations) linked by a set of social relationships (e.g., friendship, transfer of funds) of a specific type" (Laumann et al. 1978, p. 458) and provide entrepreneurs the opportunity to create, use, and maintain social capital (De Carolis and Saparito 2006).

Every entrepreneur's network consists of a mixture of weak and strong ties (Dubini and Aldrich 1991; Hoang and Antoncic 2003). The strength of the tie will depend on the frequency of the interaction (frequent versus infrequent), the nature of the relationship (friend or family versus acquaintance), the emotional intensity (affective versus nonaffective), and the multiplexity of the relationship (friend and investor) (Jack 2005; Ruef 2002). Although there are still conflicting views on the optimal combination of strong and weak ties, the consensus is that weak ties expose the entrepreneur to diverse information and contacts (De Carolis et al. 2009), whereas strong ties provide access to otherwise unattainable resources (Krackhardt 1992). Entrepreneurs'

networks are also characterized by their degree of homophily, such that they tend to establish bonds with people that have similar personal attributes, preferences, norms, and attitudes (McPherson et al. 2001). These network features can therefore influence the various stages of the entrepreneurship process (Aldrich and Zimmer 1986; Lechner and Dowling 2003) and affect the transfer of knowledge between network agents (Inkpen and Tsang 2005). Entrepreneurs' personal networks were also found to have a positive and significant influence on small business performance, depending on the age, industry, and institutional context of the small firms (Stam et al. 2014). With respect to women entrepreneurs, studies have found that social capital is important for the startup phase and that network diversity positively affected the use of personal sources of funding (Carter et al. 2003).

Originating from work on clusters (Bell et al. 2009) and economic geography (Audretsch and Feldman 1996; Malecki 1997), entrepreneurial ecosystems are defined as the agglomeration of interrelated individuals, institutions, organizations, and regulatory entities in a particular geographic area that act upon and promote entrepreneurial initiatives and actions (Isenberg 2010). The increase in ecosystem research has led to a variety of conceptualizations, with social capital and network being an integral (albeit underdeveloped) component in all of them. Table 1 summarizes the descriptions of social capital and networks provided by different ecosystem studies (Ács et al. 2014; Feld 2012; Foster et al. 2013; Isenberg 2010; Neck et al. 2004; Spigel 2017; Stam 2015). For example, Neck et al. (2004) suggest that formal and informal networks are critical to support and promote new venture creation. Feld

(2012) and Stam (2015) consider diverse and dense networks a precursor for entrepreneurs to find new entrepreneurial opportunities, solicit advice, and grow their ventures; and the World Economic Forum (Foster et al. 2013) and Spigel (2017) highlight mentoring, advising, and peer networking as a critical component of social capital within entrepreneurial ecosystems.

Despite the evidence that social capital and networks have beneficial effects on entrepreneurship (Anderson and Jack 2002), more critical voices point out that an overreliance on social capital and strong-tie networks promotes mediocrities (Light 2010), reduces objectivity (Locke et al. 1999), or creates barriers for historically disadvantaged groups such as novice, women, or minority entrepreneurs (Light and Dana 2013). In a study on the boundaries of social capital in entrepreneurship, Light and Dana (2013) argued that a combination of strong bonding capital (within-group ties), weak bridging capital (external ties), and cultural disinterest in entrepreneurship proliferates the formation of disconnected social clusters in entrepreneurial (eco)systems. Such stratifications have also been found in more "mainstream" ecosystems, where male-dominated strong-tie high-growth venture networks are often socially disconnected from managed-growth, lifestyle, and survival venture networks (Brush and Chaganti 1999; Edelman et al. 2010).

Therefore, previous research suggests that the favorable effects of social capital and networks will vary with gender (Brush et al. 2009), different types of ventures (Morris et al. 2016), race, and ethnicity (Light and Dana 2013) and can lead to the formation of social boundaries in entrepreneurial ecosystems.

Table 1 Social capital and networks in entrepreneurial ecosystems

Description	References
Formal and informal social networks with a focus on high-technology companies; spinoff networks	Neck et al. (2004)
Formal and informal networking groups; integration of expatriates	Isenberg (2010)
Dense networks between sectors, demographics and cultures; network of institutions	Feld (2012)
Mentoring, advisor, and peer networks	World Economic Forum (2013)
Networking pillar—measured by average of personal connection with entrepreneurs	Acs et al. (2014)
Networks of entrepreneurs, advisors, investors, and workers; mentoring networks for novice entrepreneurs	Spigel (2017)
Network density—community of entrepreneurs, startups, investors, advisors, mentors, and supporters distributed across sectors, demographics, and culture	Stam (2015)

2.2 Boundaries of social capital and networks

2.2.1 The effect of gender

With respect to women entrepreneurs, social capital and network barriers emerge as a by-product of skewed expectations, biases, and "naïve theories underlying investors' conscious and subconscious search criteria" (Brooks et al. 2014). As a result, women are often excluded from accessing male-dominated high-level networks in politics and industry (Nikolova 1993; Smallbone and Welter 2001). These patriarchal structures were found to be especially prevalent in transitional economies such as Bulgaria, Moldova, or the Ukraine (Manolova 2006; Welter et al. 2004). In more established economies like the USA, such barriers are less salient, with government agencies providing a wide variety of support mechanisms, depending on industry, type of entrepreneurial venture, or socioeconomic status of the entrepreneur-to-be (Acs and Szerb 2007; Mason and Brown 2013). Some problems persist, however. For example, in a study on business loans, researchers found that despite receiving similar loan conditions, female business owners felt disproportionally disrespected by lending officers (Fabowale et al. 1995).

Hence, previous scholarly research suggests that the role that social capital and networking play across the different stages of the entrepreneurship process, and as such, in the entrepreneurial ecosystem are different for men and women. Accordingly, we propose the following hypothesis:

> *Hypothesis 1:* Women entrepreneurs have lower levels of social capital than male entrepreneurs.

Putnam (2000) distinguishes between bonding and bridging social capital. Bonding social capital is generated through strong-tie relationships between members of a group or network who are similar in certain aspects (e.g., race, gender, profession). For example, women entrepreneurs join female-only business associations or clubs such as the Female Entrepreneur Association or the Women Business Owners of North Florida Association, seeking partnerships and emotional support. However, these strong-tie networks come with some caveats, such as lower access to diverse information. Therefore, research suggests that female entrepreneurs should configure their networks using pertinent quality factors such as density, diversity, reachability, and appropriate ties (McGowan and Hampton 2007) to build bridging social capital. Bridging social capital forms through primarily weak-tie relationships between individuals or groups with dissimilar characteristics. An example of bridging social capital includes women entrepreneurs' effort to build outgroup connections with heterogeneous groups, such as the National Venture Capital Association. Both bridging and bonding social capital were found to be important predictors for nascent female and male entrepreneurs (Davidsson and Honig 2003). However, previous studies point out that female entrepreneurs often trail their male counterparts when it comes to bridging social capital (McGowan and Hampton 2007). Based on this reasoning, we put forward the following hypothesis:

> *Hypothesis 2*: Women entrepreneurs have a higher degree of bridging social capital than male entrepreneurs.

As far as the level of bonding social capital is concerned, previous studies suggest that no significant differences should be expected between women and male entrepreneurs as homophilous ties develop more naturally than heterophilous (McPherson et al. 2001). Thus, we suggest that bonding social capital will not significantly differ between male and female entrepreneurs. Grounded on this reasoning, we propose the following hypothesis:

> *Hypothesis 3*: Female and male entrepreneurs' degree of bonding capital does not differ significantly.

2.2.2 The effect of gender and venture typology

Entrepreneurial ventures come in all different shapes and forms going beyond the traditional "fixation" on high-tech/high-growth entrepreneurship (Shane 2009; Welter 2011). A recent typology developed by Morris et al. (2016) separated entrepreneurial ventures into four types—survival, lifestyle, managed growth, and aggressive growth—that were defined on the basis of annual growth rate, time horizon, management focus, skills, and style, entrepreneurial orientation, technology investment, source of finance, exit approach, and economic motives of the founder. This typology has been used to examine the impact of entrepreneurship on society (Kuratko 2016) and economic development (Morris

et al. 2015), supporting the need for diverse entrepreneurial ecosystems with a panoply of businesses. Ownership of these ventures, however, is not equally distributed between male and female entrepreneurs, as women often have to conciliate their venture choices with the multiple roles they fulfill in the society (e.g., mother, family manger). Accordingly, women have been historically underrepresented in the high-growth/high-technology venture community (Brush et al. 2004), where implicit and explicit biases hinder their access to venture capital (Greene et al. 2001). Hence, previous research suggests that the distribution of social capital in an entrepreneurial ecosystem between male and female entrepreneurs is different for each type of venture network. Based on this reasoning, we put forward the following hypothesis:

Hypothesis 4: The likelihood that women entrepreneurs have lower levels of social capital than male entrepreneurs is larger in high-growth ventures, than in managed-growth, lifestyle, or survival ventures.

2.2.3 The effect of gender, race, and ethnicity

Previous sociological studies have suggested that social capital and network properties can differ across racial and ethnic groups (Lin 2000). In a study on confiding networks, Marsden (1988) showed that network diversity and size was affected by ethnicity, with individuals identifying as white having the largest networks, followed by individuals that identify as Hispanic and black. In entrepreneurship, Min et al. (1993) showed that immigrant entrepreneurs, who are new to a country and have few physical and financial assets, can connect to ethnic business networks and create business opportunities. In another study on social stratifications of minority entrepreneurs, the authors found that African American women entrepreneurs had to overcome social capital hurdles related to both their race and gender. They argue that gender and race are important features of how individuals experience social barriers to entrepreneurship and that these social stratifications are still underexplored (Robinson et al. 2007). However, the inequality in bridging social capital across different racial and ethnic groups in entrepreneurship is still unexplored empirically. Building on these studies, we examine differences in bridging social capital between women entrepreneurs of different ethnical backgrounds and thus hypothesize that:

Hypothesis 5: Women entrepreneurs that self-identify as white have higher levels of bridging social capital than non-white women entrepreneurs.
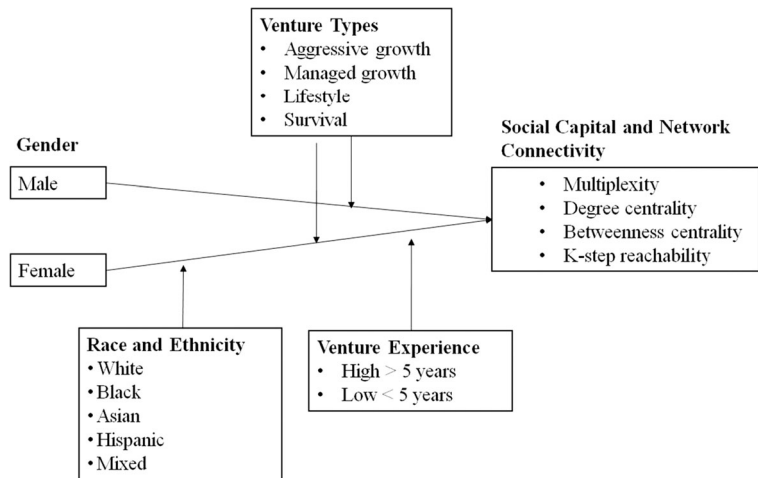
2.2.4 The effect of gender and venture experience

Entrepreneurship is a "lived experience" impacting the emergence of the entrepreneur, venture, and ecosystem (Morris et al. 2012). Venture experience affects how entrepreneurs navigate through the entrepreneurship process, and is also a critical contextual factor affecting learning, emotions, decision-making (Morris et al. 2012), and social capital (Baron and Markman 2000). Past entrepreneurship experience is a specific form of human capital which positively contributes to social capital (Kor and Sundaramurthy 2008). Together with social capital, venture experience is a predictor of engagement in nascent entrepreneurship (Davidsson and Honig 2003), promoting access to venture capitalists, potential customers, key informants in professional associations, and other stakeholders.

Therefore, individuals with past entrepreneurial experience have an advantage with respect to social capital, as they have easily accessible network that they can leverage to obtain resources from (Baron and Markman 2000). As such, past venture experience is an important social capital boundary condition to consider. Based on this reasoning, we expect to find differences in bridging social capital between experienced and novice women entrepreneurs:

Hypothesis 6: Women entrepreneurs with more venture experience have a higher degree of bridging social capital than women entrepreneurs with little to no venture experience.

Figure 1 presents our conceptual model. We focus on the effect of gender on social capital and network properties in the context of entrepreneurial ecosystems and analyze the role of three boundary conditions: venture type, race and ethnicity, and past venture experience. We define our study in the context of two municipal entrepreneurial ecosystems modeled as a social network of stakeholders.

Fig. 1 The effect of gender, venture type, race, ethnicity, and past venture experience on social capital and network connectivity in entrepreneurial ecosystems

3 Context of the study

We conducted a study in two municipalities in Florida—Gainesville and Jacksonville—that are geographically, demographically, and economically proximate (see Table 2). Gainesville is located in the north central Florida with a population of 128,340 (data from 2012). Among the top employers are the local university and hospital complex, large retailers, and government organizations. Starting in 2006, a concerted effort was made by the local government, the chamber of commerce, and the university system to focus on the development of

Table 2 Demographic and economic overview of the two municipalities, Florida, and the USA

	Gainesville	Jacksonville	Florida	USA
Population	128,460	853,382	20,271,272	318,857,056
GDP (2014) (per capita)	$19,616	$25,374	$38,497	$28,155
Number of firms[1]	10,980	64,114	2,100,187	27,092,908
Ownership by race[1]				
White	71.1%	63.3%	79.5%	77.9%
Black	14.1%	25.6%	11.9%	7.1%
Asian	7.5%	6.3%	3.8%	5.7%
Ownership by ethnicity[1]				
Hispanic	6.4%	7.1%	28.6%	11.9%
Ownership by gender[1]				
Male-led	54.5%	49.8%	52.4%	54.6%
Female-led	36.9%	42.3%	39.0%	36.3%
Equally owned	8.7%	7.9%	8.6%	9.0%
Land area (in square miles)	61.31	747.00	65,755	3,531,905
Number of venture capital firms[2]	3	3	~40–55	2917
Venture capital investment (in $ million) for 2014[3]	7.4	5.1	866.5	48,000
Average rate of exits from 2003 to 2013 (in %)[1]	9.8	11.4	11.7	9.8
Average rate of entries from 2003 to 2013 (in %)[1]	11.4	13.7	13.8	10.9

Data from 2012

[1] Source: census.gov

[2] Source: Center for Venture Research

[3] Source: pwcmoneytree.com

high-growth/high-tech ventures. One prominent example is the creation of the *Innovation Hub*, an initiative between the city and the local university that is providing early-stage ventures with low-cost working space, mentoring, legal support, and investor networks.

Jacksonville's economy is broadly diversified among distribution, financial services, biomedical, technology, consumer goods, information services, manufacturing, insurance, biomedical, technology, and other industries. Jacksonville counts approximately 850,000 inhabitants and 747 mile^2 of land area; houses about 25 colleges and universities, totaling 48,396 students (data from 2012); and has been the center of many new entrepreneurial initiatives. For example, OneSpark—an annual crowdfunding festival—provides a platform for "creations" in art, innovation, music, science, social good, and technology (see news4jax.com).

3.1 Sampling strategy, measures, and data analysis

We apply respondent-driven sampling as proposed by Heckathorn (1997). This methodology is best suited to adequately examine networks of hidden populations, such as the relational ties between entrepreneurs and their stakeholders in a local entrepreneurial ecosystem (Heckathorn 2002). As there is little to no public information (e.g., lists or directories) available on the characteristics and structure of the (often nonrandom) relational ties between stakeholders in our two municipal entrepreneurial ecosystems of choice, respondent-driven sampling was found to be most appropriate.

The nonrandom nature of social network connections (Berg 1988) is another reason for using respondent-driven sampling, where an initial pool of respondents will provide information on their network connections and referrals, thereby allowing researchers to proficiently capture social regions that are not accessible with other methods (Salganik and Heckathorn 2004). The selection criteria for the initial "seed" of respondents varies based on the complexity of the network to be examined. In our case, our intent was to capture the diversity of entrepreneurial stakeholders, such as different types of supporting organizations, entrepreneurs, and ventures. Therefore, our approach was as follows. First, we purposively selected an initial set of eight interviewees in each ecosystem, who served as the seeds for the chain-referral. To ensure diversity, we made certain to include different stakeholder categories in each of the municipal ecosystems: four entrepreneurs,

one investor, as well as the institutional leaders from one government agency, one incubator/accelerator organization, and one institution of higher education. To capture the diverse types of entrepreneurial ventures in each municipal ecosystem, we selected one individual from each one of the four types of ventures (Morris et al. 2016) in our initial seed. To recruit the seed subject of *survival ventures*, we visited local street vendors, informal markets, flea markets, and craft fairs. We selected the initial seed *lifestyle* entrepreneur by directly contacting small business owners in the community, and the *managed-growth* entrepreneur initial seed was identified using the database of the local chamber of commerce, selecting ventures with an annual growth rate of 10–15%. The initial seed *aggressive-growth* entrepreneur was identified through personal contacts and public records of high-growth ventures affiliated with incubators/accelerators, meeting our requirement of at least 20% annual revenue growth.

These eight seeds were the foundation of two subsequent recruitment chains. Based on the referrals and introductions provided by the initial seed of participants, a second wave led to the recruitment of an additional 22 participants, comprising a total of 30 individuals from each ecosystem. In the third wave, we reached a final sample of 60 individuals in each ecosystem, totaling 120 participants. We conducted in-depth face to face interviews, lasting 45 min each. All interviews were recorded. The protocol included a set of questions related to the attendance at entrepreneurship-related events, the entrepreneurs/investors/institutional leaders they interact with most frequently, the nature of these interactions, and their personal history of entrepreneurship to capture their ties with the entrepreneurial ecosystem. Each interview resulted in a set of nodes that were subsequently assembled into a network, approximating the entrepreneurial ecosystem. The nodes in the network correspond to other stakeholders of the ecosystem that the interviewee is interacting with, such as entrepreneurs, investors, or leaders of the various institutions or organizations (e.g., universities, regulatory agencies, etc). Each participant generated between 7 and 20 connections with other stakeholders of the entrepreneurial ecosystem, leading to a network of 745 nodes in the Gainesville ecosystem (GNVEco) and 871 nodes in the Jacksonville ecosystem (JAXEco). Participation in the study was voluntary. We did not provide any referral incentives.

Data was analyzed using a social network data analysis program called UCINET (Borgatti et al. 1999), examining the two ecosystem networks using four distinct measures: (1) *multiplexity*, (2) *degree centrality*, (3) *betweenness centrality*, and (4) *2-step reachability* (see Table 3).

OLS regression was used to examine the influence of actors' attributes on their degree of social capital (betweenness centrality, multiplexity) and network connectivity (2-step reach centrality and degree centrality) in the ecosystem network. In contrast to traditional statistical techniques such as the *t test* or *ANOVA* that describe distributions of attributes of actors, statistical techniques developed for social network analysis describe the distributions of relations among actors. Standard errors and significance will be estimated using the random permutations method.

4 Results

4.1 Hypothesis testing

Table 4 describes the characteristics of the sample of interviewees and nodes for the two municipal ecosystems.

We tested the six hypotheses through OLS regressions. Table 5 displays the results for GNVEco and JAXEco and shows that there are significant differences (the reference category for gender is male) in the distribution of social capital and network connectivity between male and female entrepreneurs for both the GNVEco and JAXEco. Specifically, the negative and statistically significant scores of outdegree centrality ($-1.289^{*}_{\text{GNVEco}}$, $-1.188^{*}_{\text{JAXEco}}$), indegree centrality ($-2.834^{***}_{\text{GNVEco}}$, $-0.827^{*}_{\text{JAXEco}}$), and out 2-step reach centrality ($-1.631^{**}_{\text{GNVEco}}$, $-0.979^{*}_{\text{JAXEco}}$) indicate that women entrepreneurs have a lower degree of social capital than male entrepreneurs. These results support our first hypothesis and were consistent for both municipal entrepreneurial ecosystems. The

betweenness centrality scores were positive and significant ($1.434^{*}_{\text{GNVEco}}$, $1.273^{*}_{\text{JAXEco}}$) indicating that women entrepreneurs in GNVEco and JAXEco have a higher level of bridging social capital than male entrepreneurs (Table 5), providing support for Hypothesis 2.

The results of the multiplexity analysis further confirmed Hypothesis 3. Although we found evidence that the presence multiplex ties were significant in aggressive- and managed-growth ventures, no significant differences between female and male entrepreneurs with respect to bonding social capital were found (Table 6). Hypothesis 4 received partial support. The results of the multiplexity analysis demonstrated that the degree of bonding social capital between male and female entrepreneurs did not differ significantly across the four venture type networks.

The differences in network connectivity and the distribution of bridging social capital between male and female entrepreneurs with respect to the four venture types are presented in Table 7. Specifically, the deviations of network connectivity and bridging social capital between male and female entrepreneurs were most significant in networks associated with high-growth ventures (HGVN) as the indegree, outdegree, and 2-step reach centrality scores showed (complete OLS results describing the gender differences for each one of the four venture type networks available upon request to the authors). Furthermore, female entrepreneurs showed a higher degree of bridging social capital than male entrepreneurs in lifestyle (LSVN) and survival venture networks (SVN). However, we found mixed results with respect to the two ecosystems. Although the social capital disparity between male and female entrepreneurs in GNV's high-growth venture network was larger than in JAX's, we did not find a similar gap in the other venture networks. Therefore, these results partially support Hypothesis 4. We elaborate on these findings in the discussion section.

Table 3 Network measures to estimate and compare network connectivity and social capital

Network measure	Function	Related studies
Multiplexity	Measure of tie strength and level of relationship	Entrepreneurs' networks (Bliemel et al. 2015)
Degree centrality	Measure of an actor's (entrepreneur or other stakeholder's) ties with other members of the ecosystem	Knowledge transfer in organizations (Tsai 2001)
Betweenness centrality	Measures the level of brokerage of an actor. Nodes with a high level of betweenness centrality act as relays in the ecosystem	Exploration of novel technologies (Gilsing et al. 2008); collaboration networks (Abbasi et al. 2012)
K-step reachability	Level of connectivity of an actor	Connectivity in industrial processes (Yang et al. 2014)

Table 4 Descriptive statistics

	GNV Eco (in %)		JAX Eco (in %)	
	Interviewees $N = 60$	Nodes $N = 745$	Interviewees $N = 60$	Nodes $N = 871$
Organizational affiliation				
Entrepreneurial ventures	48	36	46	38
Government agencies	15	19	19	17
Incubator/accelerator organizations	12	13	18	16
Investors	10	12	11	12
Higher education organizations	15	20	6	17
Demographics				
Male	55	59	57	60
Female	45	41	43	40
White	63	58	56	60
African American	14	12	18	15
Asian	10	13	12	13
Hispanic	6	9	7	5
Mixed	4	6	5	4
Other	3	2	2	3
Venture type				
Aggressive growth	22	18	14	18
Managed growth	30	30	36	28
Lifestyle	34	33	42	39
Survival	14	12	8	15
Past venture experience				
< 5 years	57	49	52	47
> 5 years	43	51	48	53

Lastly, Hypotheses 5 and 6 were partially confirmed (Table 8). We found that that female entrepreneurs that identify as ethnically white, had a higher degree of network connectivity and bridging social capital. However, only one indicator of network connectivity (out 2-step reach centrality) showed significant differences between white and black female entrepreneurs ($- 1.037^*_{GNVEco}$), as well as white and Hispanic female entrepreneurs ($- 0.944^*_{GNVEco}$) in the GNVEco. No statistically significant differences were found between white, black, Hispanic, Asian, and mixed female entrepreneurs in the JAXEco. These results provide partial support to Hypothesis 5.

With respect to Hypothesis 6, our results showed that female entrepreneurs with more venture experience had a higher degree of bridging social capital than female entrepreneurs with little to no venture experience. This finding was confirmed for both municipal ecosystems and therefore support Hypothesis 6.

5 Discussion

5.1 Theoretical and empirical contributions

Our study is in line with previous conceptualizations of social capital and networks as a relevant component in entrepreneurial ecosystems (Isenberg 2010; Neck et al. 2004; Stam 2015; Spigel 2017). Our results confirmed that there is a difference in the distribution of social capital and network connectivity between female and male entrepreneurs, supporting existing studies' findings about the disconnect between women entrepreneurs and the high-/aggressive-growth venture community (Brush et al. 2004). This effect was found for both entrepreneurial ecosystems, suggesting some degree of generalizability. While prior research focused exclusively on the gap between women entrepreneurs and high-growth ventures, our study examined a broader set of entrepreneurial

Table 5 OLS regression coefficients for subgroup differences in outdegree, indegree, out-k-step (two), and betweenness centrality

	Outdegree centrality		Indegree centrality		Out 2-step reach centrality		Betweenness centrality	
	GNVEco	JAXEco	GNVEco	JAXEco	GNVEco	JAXEco	GNVEco	JAXEco
Gender[a]								
Female	−1.289[*]	−1.188[*]	−2.834[***]	−0.827[*]	−1.631[**]	−0.979[*]	1.434[*]	1.273[*]
Ethno-racial[b]								
Black	−0.736	−0.421	−0.601	−0.509	−1.592[**]	−0.297	−1.656[**]	−0.180
Asian	−0.402	−0.290	−0.402	−0.456	−0.495	−0.333	−0.604	−0.294
Mixed	−0.307	−0.122	−0.205	−0.167	−1.393[**]	−0.402	−0.803	−0.371
Hispanic	−0.648	−0.513	−0.299	−0.223	−0.725	−0.240	−1.244[*]	−0.405
Venture type[c]								
Managed growth	−0.581	−0.312	−0.679	−0.542	−0.132	−0.301	−0.377	−0.693
Lifestyle	−0.317	−0.473	−0.543	−0.700	−0.425	−0.577	−0.231	−0.322
Survival	−1.903[***]	−1.165[*]	−1.567[**]	−1.481[**]	−1.703[**]	−0.844	−1.810[***]	−1.438[**]
Venture experience[d]								
< 5 years	−0.782	−0.604	−1.232[*]	−1.523[**]	−1.417[**]	−1.892[***]	−1.541[***]	−1.275[**]

[*] $p < 0.05$; [**] $p < 0.01$; [***] $p < 0.001$

[a] Dummy-coded variables, with "male" as reference category

[b] Dummy-coded variables, with "white" as reference category

[c] Dummy-coded variables, with "aggressive growth" as reference category

[d] Dummy-coded variables, with ">5 years" as reference category

ventures. We also found a separation along ethno-racial lines, favoring white female and male entrepreneurs, adding to the literature on the social stratification of female minority entrepreneurs (Robinson et al. 2007).

We also contribute to ongoing research on social capital and entrepreneurship. At first glance, our results support the weak-tie theory (Milroy and Milroy 1993) that postulates that second-order actors (e.g., women entrepreneurs) develop a higher degree of bridging capital, to compensate for their lower social status in the network. However, a closer look revealed that female entrepreneurs' bridging capital is contingent on the venture type network they are embedded in. We found that male entrepreneurs have a higher degree of bridging social capital in high- and managed-growth networks (only GNVEco) and that female entrepreneurs have a higher degree of bridging capital in lifestyle and survival ventures networks (GNVEco and JAXEco). This difference in social capital allotment can be attributed to the inherent characteristics and norms surrounding these types of ventures. For example, research has shown that male-oriented cultural norms are dominating in the aggressive- and managed-growth venture communities, much more so than in lifestyle and survival venture communities (Marlow and McAdam 2013).

Social capital distribution is also affected by past venture experience. As most experienced entrepreneurs in aggressive- and managed-growth ventures are male

Table 6 Multiplexity analysis between male and female entrepreneurs

Relations	Observed multiplexity		Maximum (based on total ties)	
	GNV	JAX	GNV	JAX
Aggressive growth				
Male	63	79	83[*]	105[*]
Female	34	51	58[*]	82[*]
Managed growth				
Male	135	156	167[*]	191[*]
Female	109	142	143[*]	171[*]
Lifestyle				
Male	70	102	115	181
Female	89	114	158	162
Survival				
Male	65	83	110	147
Female	83	110	130	180

[*] $p < 0.05$

Table 7 Disparity between female and male entrepreneurs' indegree, outdegree, 2-step reach centrality, and betweenness centrality scores for different venture type networks in Gainesville and Jacksonville Ecosystems

	HGVN		MGVN		LSVN		SVN	
	GNVEco	JAXEco	GNVEco	JAXEco	GNVEco	JAXEco	GNVEco	JAXEco
Indegree	M > F[**]	M > F[*]	M > F[*]	M > F	M > F	F > M	F > M	F > M[*]
Outdegree	M > F[*]	M > F	M > F[*]	M > F[*]	M > F	F > M	F > M[*]	F > M[*]
2-step reach centrality	M > F[**]	M > F[*]	M > F	M > F	M > F	F > M	F > M	F > M[*]
Betweenness centrality	M > F[*]	M > F	M > F	F > M	F > M	F > M[*]	F > M[**]	F > M[***]

HGVN high-growth venture networks, *MGVN* managed-growth venture networks, *LSVN* lifestyle venture networks, *SVN* survival venture networks, *M* male, *F* female

[*] $p < 0.05$; [**] $p < 0.01$; [***] $p < 0.001$

or are supportive of male norms, female entrepreneurs are at a disadvantage in finding brokers to access different parts of the venture network. Similarly, experienced female entrepreneurs have an advantage over their novice counterparts when it comes to building a diverse network with a high level of bridging social capital. Therefore, mentorship relationships are a valuable path to further explore this question.

Lastly, our choices with respect to study design and methodology provided a bridge between studies on social networks and entrepreneurial ecosystems. Given that the empirical development of entrepreneurial ecosystems is still at an early stage, our approach offered empirical insights to develop an assessment framework that is not exclusively relying on macroeconomic data. Previous work has predominantly focused on developing single scale views of entrepreneurship. The unit of analysis is the entrepreneur or the entrepreneur firm, with only a few notable exceptions (Moliterno and Mahony 2011). Our approach offers the possibility to empirically explore the social boundaries between entrepreneurs and ventures with different characteristics in entrepreneurial ecosystems. This is particularly relevant for research on female entrepreneurs, as previous studies (Ahl and Marlow 2012; Calas

Table 8 OLS regression coefficients for subgroup differences in outdegree, indegree, out-k-step (two), and betweenness centrality for female entrepreneurs

	Outdegree centrality		Indegree centrality		Out 2-step reach centrality		Betweenness centrality	
	GNVEco	JAXEco	GNVEco	JAXEco	GNVEco	JAXEco	GNVEco	JAXEco
Ethno-racial[a]								
Black	− 0.836	− 0.319	− 0.901	− 0.453	− 1.037[*]	− 0.119	− 0.699	− 0.094
Asian	− 0.178	− 0.254	− 0.404	− 0.343	− 0.230	− 0.276	− 0.340	− 0.409
Mixed	− 0.264	− 0.376	− 0.205	− 0.199	− 0.363	− 0.153	− 0.703	− 0.667
Hispanic	− 0.448	− 0.468	− 0.699	− 0.317	− 0.618	− 0.401	− 0.944[*]	− 0.189
Venture type[b]								
Managed growth	− 0.341	0.095	− 0.769	− 0.101	− 0.489	− 0.237	0.577	− 0.086
Lifestyle	− 0.194	− 0.237	− 0.095	− 0.560	− 0.253	− 0.384	− 0.111	− 0.225
Survival	− 0.965[*]	− 0.902[*]	− 0.889	− 1.177[**]	− 1.105[*]	− 0.998[*]	− 1.328[**]	− 1.513[***]
Venture experience[c]								
< 5 years	− 0.776	− 0.863	− 0.971[*]	− 1.235[*]	− 0.899	− 1.022[*]	− 1.001[*]	− 1.147[**]

[*]$p < 0.05$; [**]$p < 0.01$; [***]$p < 0.001$

[a] Dummy-coded variables, with "white" as reference category

[b] Dummy-coded variables, with "aggressive growth" as reference category

[c] Dummy-coded variables, with "> 5 years" as reference category

et al. 2009) have pointed out that gendered norms that surround (high-growth) entrepreneurship can marginalize the perspectives of female entrepreneurs and prevent them from participation. Therefore, our research breaks new ground as it uses social network matrix to more accurately assess the role and position of (minority) women entrepreneurs in entrepreneurial ecosystems. Furthermore, entrepreneurship is, by itself, a nonlinear process, exposed to chaotic dynamics, fractal structures, fuzzy boundaries, and the emergence of new properties. Thus, traditional linear methodologies to analyze entrepreneurship might have some limitations that could be alleviated by the ability of network analytical techniques to capture the nonlinearity and dynamics of entrepreneurial ecosystems.

5.2 Implications for practice

Several interesting findings can be derived for practitioners. Specifically, our results are informative for women entrepreneurs as they show that women need to find the environment that provides the necessary resources—be that financial, human, or social capital—to successfully establish and/or grow their preferred type of venture. Women entrepreneurs that run lifestyle businesses need to build ties that secure long-term financing and an affordable location, but also connect with the local community to better respond to changes in the economic and regulatory environment. In contrast, women entrepreneurs that want to build aggressive growth ventures need to build networks that help them raise risk capital and recruit new employees to satisfy the growth needs.

Our results also highlight that women need to focus on developing their bridging social capital, as it will enable them to access resources that are outside of their strong-tie networks, and therefore, will contribute to the survivability of their ventures. As such, supporting organizations such as universities, incubators, or small business development offices need to promote and incentivize activities, initiatives, and meetings that help women entrepreneurs to diversify their networks and thereby increase their bridging social capital.

5.3 Limitations and future research

This study has several limitations. Firstly, building up a dataset using respondent-driven sampling is time intensive. Although we applied well-tested procedures to minimize biases, we had to constantly monitor our sample which created scalability issues. In addition, we acknowledge that our sample size is not very large when compared with entrepreneurship studies that leverage macroeconomic data. The lack of time-series data is another limitation of this study. Our rationale for not collecting network data through multiple time points was based on high attrition rates reported by previous studies (Grossman et al. 2012). There are also limitations regarding measurement processes. Currently, indices on entrepreneurial ecosystems do not include network data such as betweenness centrality or multiplexity. To alleviate some of these limitations, future studies could access popular social networks to subsequently couple them with existing macrolevel datasets, which will provide researchers with the opportunity to address research questions about women entrepreneurs, for example, the examination of women entrepreneurs' pathways to determine common hurdles and bottlenecks for their entrepreneurial development. Reconstructing an entrepreneurial ecosystem through social networks poses unique challenges due to its dynamic behavior and the plurality of stakeholders.

Ecosystem identity A yet unexplored question is if and how entrepreneurial ecosystems form distinguishable identities that affect female entrepreneurship. Future studies could leverage existing work on entrepreneurial, organizational, and collective identities, to subsequently develop an identity inventory that consists of:

1. Constitutive norms—formal and informal rules that define group membership. Examples include the norms on entrepreneurial characteristics (Stephan and Uhlaner 2010).
2. Social purposes—goals shared by members of the ecosystem. Examples include the intention for venture growth (Edelman et al. 2010) or social change (Calas et al. 2009).
3. Relational comparisons—attributes that are used to differentiate one identity group from another. Examples include the distinction between certain types of ventures (Morris et al. 2016).
4. Cognitive models—frameworks that are used to describe a group's ontology and epistemology. Examples include ways of assessing entrepreneurial opportunities (Dew et al. 2009).

Ecosystem routines and capabilities Using social network data, future studies can examine the formation and change of such routines and capabilities. Are there routines and capabilities of entrepreneurial ecosystems that foster or

dampen female entrepreneurs? To that purpose, existing theoretical frameworks on organizational routines (e.g., McKeown 2001) need to be adapted and further developed. Dimensions of organizational routines such as regularity, collectiveness, recurrence, consciousness and subconsciousness, context specificity, embeddedness, path dependence, and the existence of triggers (Becker 2001) need to be rethought for entrepreneurial ecosystems. Similarly, researchers need to reevaluate what standard, operational, and dynamic capabilities (Teece 2012) mean in the context of an entrepreneurial ecosystem.

6 Conclusions

At a time when the rate of female entrepreneurship is increasing worldwide, the importance of understanding the contextual aspects of how women build and grow ventures cannot be understated. One such contextual factor is the ability (or lack thereof) for female entrepreneurs to develop social capital in an entrepreneurial ecosystem. To address this issue, our study adopted a social network approach to examine the effects of venture typology, race, ethnicity, and past venture experience on the distribution of social capital and network connectivity of female entrepreneurs in two municipal entrepreneurial ecosystems. Our results create the need for a more nuanced understanding of how individual and venture characteristics play a role in the formation of social capital boundaries. For example, we found that female entrepreneurs engaged in high-growth ventures showed a lower degree of bridging social capital than male entrepreneurs. However, this effect was reversed for female entrepreneurs engaged in lifestyle and survival ventures. This provides for an expanded view of how social capital boundaries exist from across different venture contexts, and suggests that future research on entrepreneurial ecosystems needs to examine the configuration of different venture types more systematically. Therefore, we conclude that a more concerted effort is needed to collect and incorporate network measures more reliably and comprehensibly. These research developments will provide both a more nuanced and rigorous understanding of the role and position of female entrepreneurs in entrepreneurial ecosystems.

References

Abbasi, A., Hossain, L., & Leydesdorff, L. (2012). Betweenness centrality as a driver of preferential attachment in the evolution of research collaboration networks. *Journal of Informetrics, 6*(3), 403–412.

Ács, Z. J., Autio, E., & Szerb, L. (2014). National systems of entrepreneurship: measurement issues and policy implications. *Research Policy, 43*(3), 476–494.

Acs, Z. J., & Szerb, L. (2007). Entrepreneurship, economic growth and public policy. *Small Business Economics, 28*(2–3), 109–122.

Adler, P. S., & Kwon, S.-W. (2002). Social capital: prospects for a new concept. *Academy of Management Review, 27*(1), 17–40.

Ahl, H., & Marlow, S. (2012). Exploring the dynamics of gender, feminism and entrepreneurship: advancing debate to escape a dead end? *Organization, 19*(5), 543–562.

Aldrich, H., & Zimmer, C. (1986). Entrepreneurship through social networks. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship.*

Anderson, A. R., & Jack, S. L. (2002). The articulation of social capital in entrepreneurial networks: a glue or a lubricant? *Entrepreneurship & Regional Development, 14*(3), 193–210.

Audretsch, D. B., & Feldman, M. P. (1996). R&D spillovers and the geography of innovation and production. *The American Economic Review, 86*, 630–640.

Baron, R. A., & Markman, G. D. (2000). Beyond social capital: how social skills can enhance entrepreneurs' success. *The Academy of Management Executive, 14*(1), 106–116.

Becker, M. C. (2001). *The role of routines in organizations: an empirical and taxonomic investigation.* University of Cambridge.

Bell, S. J., Tracey, P., & Heide, J. B. (2009). The organization of regional clusters. *Academy of Management Review, 34*(4), 623–642.

Berg, S. (1988). Snowball sampling. In S. Kotz & N. I. Johnson (Eds.), *Encyclopedia of statistical sciences.* New York: Wiley.

Bliemel, M. J., McCarthy, I. P., & Maine, E. M. A. (2015). Levels of multiplexity in entrepreneur's networks: implications for dynamism and value creation. *Entrepreneurship Research Journal, 0*(0).

Borgatti, S. P., Everett, M. G., & Freeman, L. C. (1999). *UCINET 6.0 Version 1.00.* Natick: Analytic Technologies.

Bosma, N., Van Praag, M., Thurik, R., & De Wit, G. (2004). The value of human and social capital investments for the business performance of startups. *Small Business Economics, 23*(3), 227–236.

Bourdieu, P. (1986). The forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education.* New York: Greenwood Publishing Group.

Bourdieu, P., & Wacquant, L. J. (1992). *An invitation to reflexive sociology.* University of Chicago Press.

Brooks, A. W., Huang, L., Kearney, S. W., & Murray, F. E. (2014). Investors prefer entrepreneurial ventures pitched by attractive men. *Proceedings of the National Academy of Sciences, 111*(12), 4427–4431.

Brush, C. G., & Chaganti, R. (1999). Businesses without glamour? An analysis of resources on performance by size and age in

small service and retail firms. *Journal of Business Venturing,* 14(3), 233–257.

Brush, C. G., De Bruin, A., & Welter, F. (2009). A gender-aware framework for women's entrepreneurship. *International Journal of Gender and Entrepreneurship, 1*(1), 8–24.

Brush, C. G., Carter, N. M., Gatewood, E., Greene, P. G., & Hart, M. M. (2004). *Clearing the hurdles: women building high-growth businesses*. Upper Saddle River: Prentice-Hall.

Calas, M. B., Smircich, L., & Bourne, K. A. (2009). Extending the boundaries: reframing "entrepreneurship as social change" through feminist perspectives. *Academy of Management Review, 34*(3), 552–569.

Carter, N., Brush, C., Greene, P., Gatewood, E., & Hart, M. (2003). Women entrepreneurs who break through to equity financing: the influence of human, social and financial capital. *Venture Capital: an International Journal of Entrepreneurial Finance, 5*(1), 1–28.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95–S120.

Colombo, M. G., Franzoni, C., & Rossi-Lamastra, C. (2015). Internal social capital and the attraction of early contributions in crowdfunding. *Entrepreneurship Theory and Practice, 39*(1), 75–100.

Cope, J., Jack, S., & Rose, M. B. (2007). Social capital and entrepreneurship: an introduction. *International Small Business Journal, 25*(3), 213–219.

Davidsson, P., & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing, 18*(3), 301–331.

De Carolis, D. M., Litzky, B. E., & Eddleston, K. A. (2009). Why networks enhance the progress of new venture creation: the influence of social capital and cognition. *Entrepreneurship Theory and Practice, 33*(2), 527–545.

De Carolis, D. M., & Saparito, P. (2006). Social capital, cognition, and entrepreneurial opportunities: a theoretical framework. *Entrepreneurship Theory and Practice, 30*(1), 41–56.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: differences between experts and novices. *Journal of Business Venturing, 24*(4), 287–309.

Dubini, P., & Aldrich, H. (1991). Personal and extended networks are central to the entrepreneurial process. *Journal of Business Venturing, 6*(5), 305–313.

Edelman, L. F., Brush, C. G., Manolova, T. S., & Greene, P. G. (2010). Start-up motivations and growth intentions of minority nascent entrepreneurs. *Journal of Small Business Management, 48*(2), 174–196.

Fabowale, L., Orser, B., & Riding, A. (1995). Gender, structural factors, and credit terms between Canadian small businesses and financial institutions. *Entrepreneurship: Theory and Practice, 19*(4), 41–66.

Feld, B. (2012). *Startup communities: building an entrepreneurial ecosystem in your city*. Hoboken: Wiley.

Florin, J., Lubatkin, M., & Schulze, W. (2003). A social capital model of high-growth ventures. *Academy of Management Journal, 46*(3), 374–384.

Foster, G., Shimizu, C., Ciesinski, S., Davila, A., Hassan, S., Jia, N., & Morris, R. (2013). Entrepreneurial ecosystems around the globe and company growth dynamics. In *World Economic Forum* (Vol. 11).

Gilsing, V., Nooteboom, B., Vanhaverbeke, W., Duysters, G., & van den Oord, A. (2008). Network embeddedness and the exploration of novel technologies: technological distance, betweenness centrality and density. *Research Policy, 37*(10), 1717–1731.

Greene, P. G., Brush, C. G., Hart, M. M., & Saparito, P. (2001). Patterns of venture capital funding: is gender a factor? *Venture Capital: An International Journal of Entrepreneurial Finance, 3*(1), 63–83.

Grossman, E. B., Yli-Renko, H., & Janakiraman, R. (2012). Resource search, interpersonal similarity, and network tie valuation in nascent entrepreneurs' emerging networks. *Journal of Management, 38*(6), 1760–1787.

Heckathorn, D. D. (1997). Respondent-driven sampling: a new approach to the study of hidden populations. *Social Problems, 44*, 174–199.

Heckathorn, D. D. (2002). Respondent-driven sampling II: deriving valid population estimates from chain-referral samples of hidden populations. *Social Problems, 49*(1), 11–34.

Hoang, H., & Antoncic, B. (2003). Network-based research in entrepreneurship: a critical review. *Journal of Business Venturing, 18*(2), 165–187.

Inkpen, A. C., & Tsang, E. W. (2005). Social capital, networks, and knowledge transfer. *Academy of Management Review, 30*(1), 146–165.

Isenberg, D. J. (2010). How to start an entrepreneurial revolution. *Harvard Business Review, 88*(6), 40–50.

Jack, S. L. (2005). The role, use and activation of strong and weak network ties: a qualitative analysis*. *Journal of Management Studies, 42*(6), 1233–1259.

Kor, Y. Y., & Sundaramurthy, C. (2008). Experience-based human capital and social capital of outside directors. *Journal of Management, 35*(4), 981–1006.

Krackhardt, D. (1992). The strength of strong ties: the importance of philos in organizations. *Networks and Organizations: Structure, Form, and Action, 216*, 239.

Kuratko, D. F. (2016). Different entrepreneurial ventures for greater societal value: a portfolio approach to assist public policy. *The Antitrust Bulletin, 61*(4), 546–560.

Laumann, E. O., Galaskiewicz, J., & Marsden, P. V. (1978). Community structure as interorganizational linkages. *Annual Review of Sociology, 4*(1), 455–484.

Lechner, C., & Dowling, M. (2003). Firm networks: external relationships as sources for the growth and competitiveness of entrepreneurial firms. *Entrepreneurship & Regional Development, 15*(1), 1–26.

Lechner, C., Frankenberger, K., & Floyd, S. W. (2010). Task contingencies in the curvilinear relationships between inter-group networks and initiative performance. *Academy of Management Journal, 53*(4), 865–889.

Light, I. (2010). The religious ethic of the Protestant ethnics. In L.-P. Dana (Ed.), *Entrepreneurship and religion* (pp. 168–183). Cheltenham: Edward Elgar.

Light, I., & Dana, L.-P. (2013). Boundaries of social capital in entrepreneurship. *Entrepreneurship Theory and Practice, 37*(3), 603–624.

Lin, N. (2000). Inequality in social capital. *Contemporary Sociology, 29*(6), 785–795.

Locke, E. A., Noorderhaven, N. G., Cannon, J. P., Doney, P. M., & Mullen, M. R. (1999). Some reservations about social capital. *Academy of Management Review, 24*(1), 8–11.

Malecki, E. J. (1997). Entrepreneurs, networks, and economic development: a review of recent research. *Advances in Entrepreneurship, Firm Emergence and Growth, 3*, 57–118.

Manolova, T. S. (2006). Builders and leaders: six case studies of men and women small proprietors in the Bulgarian construction industry. In *Growth-oriented women entrepreneurs and their businesses: a global research perspective* (p. 232).

Marlow, S., & McAdam, M. (2013). Gender and entrepreneurship: advancing debate and challenging myths; exploring the mystery of the under-performing female entrepreneur. *International Journal of Entrepreneurial Behavior & Research, 19*(1), 114–124.

Marsden, P. V. (1988). Homogeneity in confiding relations. *Social Networks, 10*(1), 57–76.

Mason, C., & Brown, R. (2013). Creating good public policy to support high-growth firms. *Small Business Economics, 40*(2), 211–225.

McGowan, P., & Hampton, A. (2007). An exploration of networking practices of female entrepreneurs. In *Female entrepreneurship: implications for education, training and policy* (pp. 110–134). New York: Routledge.

McKeown, T. J. (2001). Plans and routines, bureaucratic bargaining, and the Cuban missile crisis. *Journal of Politics, 63*(4), 1163–1190.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: homophily in social networks. *Annual Review of Sociology, 27*, 415–444.

Milroy, J., & Milroy, L. (1993). Mechanisms of change in urban dialects: the role of class, social network and gender. *International Journal of Applied Linguistics, 3*(1), 57–77.

Min, P. G., Waldinger, R., Aldrich, H., & Ward, R. (1993). *Ethnic entrepreneurs: immigrant business in industrial societies*. Newbury Park: Sage.

Moliterno, T. P., & Mahony, D. M. (2011). Network theory of organization: a multilevel approach. *Journal of Management, 37*(2), 443–467.

Morris, M. H., Kuratko, D. F., Schindehutte, M., & Spivack, A. J. (2012). Framing the entrepreneurial experience. *Entrepreneurship Theory and Practice, 36*(1), 11–40.

Morris, M. H., Neumeyer, X., Jang, Y., & Kuratko, D. F. (2016). Distinguishing types of entrepreneurial ventures: an identity-based perspective. *Journal of Small Business Management*.

Morris, M. H., Neumeyer, X., & Kuratko, D. F. (2015). A portfolio perspective on entrepreneurship and economic development. *Small Business Economics, 45*(4), 713–728.

Neck, H. M., Meyer, G. D., Cohen, B., & Corbett, A. C. (2004). An entrepreneurial system view of new venture creation. *Journal of Small Business Management, 42*(2), 190–208.

Neergaard, H., Shaw, E., & Carter, S. (2005). The impact of gender, social capital and networks on business ownership: a research agenda. *International Journal of Entrepreneurial Behavior & Research, 11*(5), 338–357.

Nikolova, M. (1993). Nyakoi demografski spekti na jenskoto predpriemachestvo (Some demographic aspects of women's entrepreneurship). *Problemi na truda, 9*, 46–61.

Putnam, R. D. (2000). Bowling alone: America's declining social capital. In *Culture and politics* (pp. 223–234). Springer.

Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1994). *Making democracy work: civic traditions in modern Italy*. Princeton University Press. Accessed 14 July 2017.

Robinson, J., Blockson, L., & Robinson, S. (2007). Exploring stratification and entrepreneurship: African American women entrepreneurs redefine success in growth ventures. *The Annals of the American Academy of Political and Social Science, 613*(1), 131–154.

Ruef, M. (2002). Strong ties, weak ties and islands: structural and cultural predictors of organizational innovation. *Industrial and Corporate Change, 11*(3), 427–449.

Salganik, M. J., & Heckathorn, D. D. (2004). Sampling and estimation in hidden populations using respondent-driven sampling. *Sociological Methodology, 34*(1), 193–240.

Shane, S. A. (2009). Why encouraging more people to become entrepreneurs is bad public policy. *Small Business Economics, 33*(2), 141–149.

Smallbone, D., & Welter, F. (2001). The distinctiveness of entrepreneurship in transition economies. *Small Business Economics, 16*(4), 249–262.

Spigel, B. (2017). The relational organization of entrepreneurial ecosystems. *Entrepreneurship Theory and Practice, 41*, 49–75.

Stam, W., Arzlanian, S., & Elfring, T. (2014). Social capital of entrepreneurs and small firm performance: A meta-analysis of contextual and methodological moderators. *Journal of Business Venturing, 29*(1), 152–173.

Stam, E. (2015). Entrepreneurial ecosystems and regional policy: a sympathetic critique. *European Planning Studies, 23*(9), 1759–1769.

Stephan, U., & Uhlaner, L. M. (2010). Performance-based vs socially supportive culture: a cross-national study of descriptive norms and entrepreneurship. *Journal of International Business Studies, 41*(8), 1347–1364.

Teece, D. J. (2012). Dynamic capabilities: routines versus entrepreneurial action. *Journal of Management Studies, 49*(8), 1395–1401.

Tsai, W. (2001). Knowledge transfer in intraorganizational networks: effects of network position and absorptive capacity on business unit innovation and performance. *Academy of Management Journal, 44*(5), 996–1004.

Welter, F. (2011). Contextualizing entrepreneurship—conceptual challenges and ways forward. *Entrepreneurship Theory and Practice, 35*(1), 165–184.

Welter, F., Smallbone, D., Isakova, N., Aculai, E., & Schakirova, N. (2004). Women's entrepreneurship in Ukraine, Republic of Moldova and Uzbekistan: results of a comparative study. In *Access to financing and ITC for women entrepreneurs in the UNECE region: challenges and good practices* (pp. 39–52). Geneva: United Nations.

Westlund, H., & Bolton, R. (2003). Local social capital and entrepreneurship. *Small Business Economics, 21*(2), 77–113.

Whittington, K. B., Owen-Smith, J., & Powell, W. W. (2009). Networks, propinquity, and innovation in knowledge-intensive industries. *Administrative Science Quarterly, 54*(1), 90–122.

Yang, F., Duan, P., Shah, S. L., & Chen, T. (2014). *Capturing connectivity and causality in complex industrial processes*. Springer Science & Business Media.

Yetim, N. (2008). Social capital in female entrepreneurship. *International Sociology, 23*(6), 864–885.