



**FINAL REPORT**

**Research on Women Entrepreneurs' Social Networks**

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## Executive Summary

There is growing and demonstrated interest in understanding the role that social networks play in the firm and job creation process. In the context of entrepreneurship, social networks provide the channels through which private information flows and facilitate information exchange beneficial, even essential, to the entrepreneurial process. Entrepreneurs depend on their networks of personal and professional relationships to make decisions and solve problems within their businesses and to strategize for success. The composition and *quality* of social networks however varies among male and female entrepreneurs and can have a direct impact upon the outcomes for each.

Social networks facilitate economic activity that encourages entrepreneurial efficiency and increases business opportunities. They represent a network of people with whom an acting or potential entrepreneur interacts regardless of his or her business activity. These networks have the ability to provide valuable resources that are not necessarily “owned” by the entrepreneur, but play a critical role in assisting the entrepreneur in achieving their business goals and objectives. Members of an entrepreneur’s social network provide support for both financial and human capital. A common example includes an entrepreneur taking advantage of a social network to seek potential funding sources.

Analysis of the structural characteristics of social networks and investigation into how entrepreneurs use social relations to leverage social capital in order to access other resources is a critically important issue for researchers, policymakers and entrepreneurs. Not all networks or network paths are created or accessed equally. Of particular importance is the role that social networks play in facilitating the growth and success of female entrepreneurs versus male entrepreneurs given the importance of women-owned businesses to job creation and the American economy. Our research investigates whether there are structural differences in the nature of entrepreneurial networks between male and female entrepreneurs and to what extent these differences manifest disparities in the effective development and success of female entrepreneurs. We concentrate on social network analysis at the nascent stage of entrepreneurial development, where entrepreneurs seek to develop, plan and launch a business.

Our research design includes positing two research hypotheses related to gender differences in social network use during the firm creation process. We test these hypotheses using multivariate regression that follows an expectancy theory model with data from the Panel Study of Entrepreneurial Dynamics.

*H1: In the entrepreneurial expectancy framework, desired outcomes for starting a new business are positively influenced by the entrepreneurs’ social network intensity (i.e., motivations using social networks).*

*H2: There are significant, observable differences in social network intensity between female and male entrepreneurs when achieving desired outcomes.*

When evaluating entrepreneurial social networks, understanding network composition, both in terms of quality and quantity of contacts is germane. For example, an entrepreneur with

three contacts, all of which are educated and have substantial industry experience, may have a better entrepreneurial social network than an entrepreneur with ten contacts, none of which have industry or startup experience. To gain a greater understanding of the dynamics of individuals that comprise an entrepreneur's social network, we constructed a social capital score for each owner (primary and secondary), key non-owner, and helper. We define social capital as the combination of industry experience, startup experience, education, and work experience an individual owns.<sup>1</sup> In addition to social capital, we develop a network number score for each entrepreneur as a means to compare the number of secondary owners, key non-owners, and helpers. That is, the quantity and quality of individuals within an entrepreneurial social network define its social network intensity. Key conclusions include:

- Male primary entrepreneurs have statistically significant higher social capital than female primary entrepreneurs. However, there is no statistically significant difference in secondary owner social capital for women-owned and men-owned businesses.
- Key non-owners in women's entrepreneurial endeavors have greater social capital than those assisting men with their entrepreneurial endeavors. This is a key point, indicating that some women entrepreneurs may attempt to bridge their own social capital gaps by associating themselves with key non-owners with relevant skills.
- Primary owner social capital positively influences entrepreneurial expectancy, which in turn affects starting a business and desired outcomes.
- Primary owner social capital is the key driver of entrepreneurial expectancy. Consistent with hypothesis 1, key non-owner social capital and helper social capital positively influence entrepreneurial expectancy, starting a business, and desired outcomes.
- The network number, a scaled number representing the number of entrepreneurial network contacts, including secondary owners, key non-owners, and helpers, does not have a statistically significant effect on entrepreneurial expectancy or desired outcomes.

Together, the above results suggest that quality is more important than quantity of network connections and that entrepreneurs do not necessarily need to network more, but need to network better. To that end, it is important that women entrepreneurs catalog and understand their own social networks. This paper raises the critical issue of what services and assistance different network members bring to the entrepreneurial table and how those individuals and their experiences (social capital) influence the primary entrepreneur's expectations and desired outcomes for the business. Our findings, coupled with existing data and research, reinforce the fact that there are gender differences in social networking, particularly as it relates to nascent entrepreneurship. Women entrepreneurs should leverage targeted opportunities based on gender, but seek to round out their social networks by leveraging the strongest and most advantageous relationships, regardless of gender. This policy promotes avoidance of the women-only silo and associated stigma as well as promotes the concept of the entrepreneurial ally, whether female or male.

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<sup>1</sup> Work experience is only available for primary and secondary owners.

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# 1. Introduction and Background

Nascent entrepreneurs must leverage valuable resources, including human, financial, intellectual, and social capital in order to increase the likelihood of success throughout the entrepreneurial process. There is growing and demonstrated interest in understanding the role that social networks play in the firm and job creation process. While popular usage and understandings of social networks have burgeoned in the past few years and many are familiar with the term given the rise of useful networking technologies such as LinkedIn, Biznik, Cofoundr and Facebook; social network analysis (SNA) as an established method has long been utilized as a theoretically driven tool and method for organizational analysis.

While social networks can reflect popular ways in which to connect and stay in touch with friends, family, peers, classmates, etc. in contemporary society, “social network analysis” can be described as “the mapping and measuring of relationships and flows between people, groups, organizations...and other connected entities...SNA provides both a visual and a mathematical analysis of human relationships.”<sup>2</sup> Social network analysis is both a well-established method through which significant relationships and business strategies may be revealed as well as a relevant concept in the lives of nascent entrepreneurs.

In the context of entrepreneurship, social networks provide the channels through which private information flows and facilitate information exchange beneficial, even essential, to the entrepreneurial process.<sup>3</sup> Greve and Salaff (2003) demonstrate that entrepreneurs talk with more people during the planning phase than other phases of business development.<sup>4</sup> A focus at the *outset* of an entrepreneurial endeavor and on the structural components, process and people within an entrepreneurial social network is therefore a useful means of examining business success and network dynamics.

Entrepreneurs depend on their networks of personal and professional relationships to make decisions and solve problems within their businesses and to strategize for success. The composition and *quality* of social networks however varies among male and female entrepreneurs and can have a direct impact upon the outcomes for each. Men for example, are more likely to have worked previously in managerial or executive positions prior to starting their own businesses. This creates an asymmetry with respect to the resources, information, and advice female and male entrepreneurs can draw from their respective networks. As an example, men are more likely to identify lawyers, accountants, and other professionals as their biggest supporters, whereas women typically identify their spouses and close friends that way.<sup>5</sup>

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<sup>2</sup> *Social Network Analysis, A Brief Introduction*. (2013). Accessed from: <http://www.orgnet.com/sna.html>

<sup>3</sup> Stuart, Toby and E. Sorenson, Olav. (2005). *Social Networks and Entrepreneurship*. The Handbook of Entrepreneurship. Accessed from [http://dimetic.dime-eu.org/dimetic\\_files/StuartSorenson%202005.pdf](http://dimetic.dime-eu.org/dimetic_files/StuartSorenson%202005.pdf)

<sup>4</sup> Greve, A. and J. Salaff. (2003). *Social Networks and Entrepreneurship*. Entrepreneurship, Theory & Practice. 28(1): 1-22.

<sup>5</sup> Robinson, Sherry and H. A. Stubberud. (2009). *Sources of Advice in Entrepreneurship: Gender Differences in Business Owners' Social Networks*. International Journal of Entrepreneurship, Volume 13.



As such, men's contacts have traditionally led to information or assistance in propagating business success. According to Robinson and Stubberud (2009), "if an entrepreneur's network is limited to a group of people who cannot provide valuable information about business, the performance of his or her firm is likely to suffer in comparison to that of a company whose owner is able to take advantage of a diverse, high quality network."<sup>6</sup> The need to understand the factors that contribute to successful network usage, growth and sustainability for women entrepreneurs in particular is essential.

Analysis of the structural characteristics of social networks and investigation into how entrepreneurs use social relations to leverage social capital in order to access other resources is a critically important issue for researchers, policymakers and entrepreneurs.<sup>7</sup> Not all networks or network paths are created or accessed equally. Of particular importance is the role that social networks play in facilitating the growth and success of female entrepreneurs versus male entrepreneurs given the importance of women-owned businesses to job creation and the American economy.<sup>8</sup>

Social networks facilitate economic activity that encourages entrepreneurial efficiency and increases business opportunities.<sup>9</sup> They represent a network of people with whom an acting or potential entrepreneur interacts regardless of his or her business activity.<sup>10</sup> These networks have the ability to provide valuable resources that are not necessarily "owned" by the entrepreneur, but play a critical role in assisting the entrepreneur in achieving their business goals and objectives. For example, women business owners often have less diverse business networks and encounter greater challenges accessing and deploying their networks than their male counterparts.<sup>11</sup> Further, the networks that women possess provide fewer contacts to clients and less entrepreneurial and managerial knowledge, putting women entrepreneurs at a disadvantage from a resource standpoint at the outset of the entrepreneurial endeavor.<sup>12</sup>

Members of an entrepreneur's social network provide support for both financial and human capital. For instance, an acquaintance may be well connected in the angel investing circle and foster an introduction leading to outside equity investments. Members of the entrepreneurial social network may also provide support by sharing their experiences and expertise with the

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<sup>6</sup> Ibid.

<sup>7</sup> Granovetter, M. (1985). *Economic Action and Social Structure: A Theory of Embeddedness*. American Journal of Sociology, 91(3), 481–510; Granovetter, M. (1992). Problems of explanation in economic sociology. In N. Nohria & R. Eccles (Eds.), *Networks and Organizations: Structure, Form, and Action*: 25–56. Boston: Harvard Business School Press

<sup>8</sup> Blank, R. (2010). *Women Owned Businesses in the 21<sup>st</sup> Century*. U.S. Department of Commerce Economics and Statistics Administration. White House Council on Women and Girls. Accessed from <http://www.esa.doc.gov/sites/default/files/women-owned-businesses.pdf>

<sup>9</sup> Fornoni, Mariel., Arribas, Ivan. Vila, Jose E. *Measurement of an Individual Entrepreneur's Social Capital: a Multidimensional Model*. National University of Mar del Plata.

<sup>10</sup> Hansen, E.L. (1995). Entrepreneurial network and new organization growth. *Entrepreneurship: Theory & Practice*, 19(4), 7–19.

<sup>11</sup> Blank. Op. cit.

<sup>12</sup> Diaz Garcia, Cristina M. Carter, Sara. *Resource Mobilization Through Business Owners' Networks: Is Gender an Issue?* International Journal of Gender and Entrepreneurship, Volume 1, No. 3. 2009.

nascent entrepreneur.<sup>13</sup> A common example includes an entrepreneur taking advantage of a social network to seek potential funding sources. Indeed, one of the most tangible benefits of programs such as incubators and accelerators is the increase in networking opportunities that can lead to seed funding or additional equity investments to help the nascent entrepreneur grow his or her business.

Nevertheless, research shows that women entrepreneurs often start with significantly lower levels of financial capital than men.<sup>14</sup> In addition, women appear to have less access to existing personal and professional networks than men.<sup>15</sup> This raises questions as to whether structural differences between female and male entrepreneurs' social networks limit the development and growth potential of female entrepreneurs and whether certain structural components of effective networks at the nascent stage can be isolated and observed.

Insufficient or inadequate networks can be devastating for a business and can serve as a barrier by preventing entrepreneurs from securing capital from optimal sources. Informal contacts are instrumental in establishing mutual trust, which is particularly important in securing financing.<sup>16</sup> Given the critical issue of access to capital for entrepreneurs, particularly women entrepreneurs, understanding the characteristics of strong social networks, both informal and formal, and their impact on business outcomes is paramount. From a financial capital standpoint, investors often prefer to take an equity stake in a business to which they are connected. Stuart and Sorenson (2005) hypothesize that social structures safeguard investor interests in this regard by reducing information asymmetry.<sup>17</sup> Overlapping social networks for investors and entrepreneurs provides a bridge of trust and information, allowing the investor to assess the entrepreneur's endeavor and integrity in more detail than a standard application process. This is particularly true of venture capitalists, which generally prefer to invest in nascent firms they learned of through referrals and close contacts.<sup>18</sup>

Our research investigates whether there are structural differences in the nature of entrepreneurial networks between male and female entrepreneurs and to what extent these differences manifest disparities in the effective development and success of female entrepreneurs. We concentrate on social network analysis at the nascent stage of entrepreneurial development, where entrepreneurs seek to develop, plan and launch a business. The primary goals of our research include addressing several research hypotheses through empirical research and more importantly, raising public policy considerations and questions that can assist policymakers, academics, and small business owners in gaining insight into the characteristics of a strong, effective network. Our results build upon the existing research, provide informative analysis for various stakeholders, and assist the National Women's Business Council (NWBC) in

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<sup>13</sup> McQuaid, R.W. *Social Networks, Entrepreneurship and Regional Development*. Small Firm Foundation and Regional Economic Development. Routledge, London. 1996.

<sup>14</sup> Robb, A. *Access to Capital among Young Firms, Minority-owned Firms, Women-owned Firms, and High-tech Firms*, released April 2013 under contract SBAHQ-11-M-0203.

<sup>15</sup> Blank, op. cit.

<sup>16</sup> Ibid.

<sup>17</sup> Stuart, op. cit.

<sup>18</sup> Ibid.

creating a toolkit for women entrepreneurs and potential investors to improve the quality and reach of their networks.

## 2. Previous Research

According to Granovetter (1973), social networks are critically important to the entrepreneurial process and are central to business venture success.<sup>19</sup> Positive indicators of social networks include network size, network density, network diversity, the balance of strong and weak ties, and network redundancy.<sup>20</sup> Both the *quality* and *quantity* of network ties is important to the entrepreneurial process.<sup>21</sup> So too is the investigation of the gaps or structural holes that may exist in an entrepreneur's social network. Bridges between gaps or holes and the significance of social capital in building network relationships are critical to the nascent entrepreneur and are important factors that have been well-considered in the social network analysis literature.<sup>22</sup>

Researchers have also studied the properties associated with networks and posit several useful facets of a successful entrepreneurial network. For example, some argue that the size of a network is important. Entrepreneurs, particularly those in the nascent stage, may want to be aware of the current size and the potential to expand and enlarge their network in order to obtain critical information from others who are well-positioned and intentioned to assist. While awareness of the extent of the network at an early stage is important, as Greve and Salaff (2003) and Blau (1977) suggest, it is more essential that the entrepreneur is well positioned within the network and that paths to resources are easily navigable.<sup>23</sup> Lastly, research on social network components emphasizes the relational structure of the social network itself. It is important to recognize the value of some network ties over others and the inherent potential for those ties to shift over time.

The importance of social networks and their involvement in the entrepreneurial process differ by phase. Butler and Hansen (1991) and Greve and Salaff (2003) found that social networks were especially critical during the pre-startup phase.<sup>24</sup> To that end, social networks play a different role during the three stages of enterprise establishment. During the initial mobilization phase, entrepreneurs discuss their preliminary ideas and develop their business concept, relying on a small network of trusted ties. In the planning phase, where entrepreneurs prepare to set up their firms, entrepreneurs access the largest network, relying on weak ties in an attempt to access financial and human capital. Finally, during the establishment phase, entrepreneurs shift their focus to the daily activities of running their firms and rely less on their

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<sup>19</sup> Granovetter, Mark S. *The Strength of Weak Ties*. American Journal of Sociology, Volume 78, Issue 6. May 1973.

<sup>20</sup> Licht, Amir N. Siegel, Jordan I. *The Social Dimensions of Entrepreneurship*. Oxford Handbook of Entrepreneurship. Oxford University Press. 2006.

<sup>21</sup> McQuaid, op. cit.

<sup>22</sup> Burt, R. et. al. (2013). *Social Network Analysis: Foundations and Frontiers on Advantage*. Annual Review of Psychology. Vol. 64: 527-547.

<sup>23</sup> Greve and Salaff. Op. cit.

<sup>24</sup> Butler, John E. Hansen, Gary S. (1991). *Network Evolution, Entrepreneurial Success, and Regional Development*. Entrepreneurship & Regional Development: An International Journal. Volume 3, Issue 1.

social networks.<sup>25</sup> The critical nature of social networks during the planning phase is central to firm survival and growth.

Building on Burt's pioneering and ongoing research, Davidsson and Honig (2003) examined the influence of human capital and social capital on entrepreneurs. They found that social capital was significantly higher in the nascent group, indicating that during the startup phase, social capital is critical. Networking facilitates the development of social capital, defined as the "resources individuals obtain from knowing others, being part of a network with them, or merely being known to them and having a good reputation." Well-developed social capital and social networks may promote the survival and growth of emerging firms.<sup>26</sup> Entrepreneurs relied on strong ties as well as weak ties, which were found to be a strong predictor of a startup's success, including the business's first sale and profit. The study further concluded that for women, education was significant in accumulating resources and knowledge throughout the entrepreneurial process. The study determined that increased social capital was positively correlated with successful resource exploitation and viable business outcomes.<sup>27</sup>

Understanding the composition and utility of an entrepreneurs' social network is key to understanding the differences between men and women's social networks. Building on the differences noted above with respect to social network composition along gender lines, Klyver (2011) investigated whether involving family members who are not part of the business and the exchange of emotional support is related to the gender of both the entrepreneur and the network connections. This research builds on the observation that female entrepreneurs are more likely to involve female and family members who are not business partners in their business activities, such that women entrepreneurs tend to have a larger proportion of women in their social networks compared to their male counterparts.

Given the importance of social networks in an entrepreneurial context via the provision of information, access to capital, access to skills, knowledge, advice, emotional support and social legitimacy, the literature indicates that as entrepreneurs progress towards operating established and successful businesses, their social networks tend to have the same proportion of men and women. That is, the social networks of surviving business owners tend to be gender-balanced and not operating within gendered silos.<sup>28</sup> It is therefore important to investigate how this network balance is achieved. Previous research indicates that quantity of network members and the gender bias may indeed be significant. However, it is possible that a focus on the quality of network connections may be most useful and a greater predictor of future sustained success.

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<sup>25</sup> Greve, Arent. Salaff, Janet W. *Social Networks and Entrepreneurship*. ET&P. Baylor University. Fall 2003.

<sup>26</sup> Robinson, Sherry and Stubberund, Hans Anton. *Sources of Advice in Entrepreneurship: Gender Differences in Business Owners' Social Networks*. International Journal of Entrepreneurship, Volume 13. 2009.

<sup>27</sup> Davidsson, Per. Honig, Benson. *The Role of Social and Human Capital Among Nascent Entrepreneurs*. Journal of Business Venturing. 2003.

<sup>28</sup> Klyver, Kim. *Gender Differences in Entrepreneurial Networks: Adding an Alter Perspective*. Gender in Management: An International Journal, Volume 26, No. 5. 2011.

As Oke (2013) notes in a recent review of the literature<sup>29</sup>, some studies suggest that women who start businesses tend to know fewer entrepreneurs than men at particular junctures. The argument is that men have more social connections that enable them to access business opportunities, information, and contacts than do women. In this way, women are disadvantaged from the start, having fewer professional connections, role models, and mentorship opportunities, which can adversely affect their businesses in the long run. Yet in applying the literature in a study of women entrepreneurs in Nigeria and using mixed methods to present data from a case study of small scale gendered enterprises, Oke finds that one substantial difference between business men and women is “that women entrepreneurs often combine multiple managerial roles and multiple dimensions of their lives, such as balancing work and home, together with a leadership role.” Building upon work by Ahmad and Naimat (2011)<sup>30</sup> as well as Aldrich (1989)<sup>31</sup> and Aldrich and Zimmer (1986)<sup>32</sup> too, women’s roles in business and the cultural expectations associated with gender as related to networking and entrepreneurial success are central to Oke’s overview of the relevant and yet still understudied aspects of business development. Women’s entrepreneurial success is more complex than early studies might suggest and that examination of the start-up phase in particular can illuminate important factors.

Hanson and Blake (2009) conducted exploratory research on the importance of entrepreneurial identity to entrepreneurial networks, hypothesizing that gender is a critical component of identity. They posed two hypotheses: (1) gender influences the construction and use of networks, and (2) trust and legitimacy, which contribute to the value of networks. The gender effects study explored the literature in detail, noting, “entrepreneurial networks are themselves embedded in place-based social, economic, cultural, and political structures that shape entrepreneurs’ identities and affect access to resources.”<sup>33</sup> This research highlights the importance of the social network in business outcomes and success.

As Kane (2010) suggests too, gender and cultural norms can both hinder as well as facilitate the ability to utilize and maximize network advantages that are already present. Kane demonstrates that a key facet to this observation is that network change, the flexibility of a network and of an entrepreneur, the ability to be both savvy and facile in navigating a network, and being an early or interested adopter (particularly in terms of technology for example) remains rather understudied in the SNA literature. Research indicates that networks can act as stages upon which ideas of gender are crafted and performed. Far from being a static means of analysis or social construct for the entrepreneur, social networks and their gendered

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<sup>29</sup> Oke, D. (2013). *The Effect of Social Network on Women Entrepreneurs in Nigeria: A Case Study of Ado-Ekiti Small Scale Enterprise*. International Journal of Education and Research. Vol. 1(11) November. 1-14

<sup>30</sup> Ahmad, H.M. and Naimat, S. (2011). *Networking and Women Entrepreneurs: Beyond Patriarchal Traditions*. African Journal of Business Management. Vol. 5(14): 5784-5791.

<sup>31</sup> Aldrich, H.E. (1989). *Networking Among Women Entrepreneurs*. In O. Hagan, C. Rivchun and D. Sexton (eds). *Women-Owned Businesses*. New York: Praeger. Pp. 103-132.

<sup>32</sup> Aldrich, H.E. and C. Zimmer. (1986). *Entrepreneurship Through Social Networks*. In D. Sexton and R. Smilor (eds). *The Art and Science of Entrepreneurship*. Ballinger Publishing: New York.

<sup>33</sup> Hanson, Susan, Blake, Megan. (2009). *Gender and Entrepreneurial Networks*. Regional Studies.

characteristics may be important factors in predicting long term outcomes for both men and women.<sup>34</sup>

Social network theory investigates the structure and patterns apparent in relationships and how those relationships influence outcomes.<sup>35</sup> Leyden et al. found that a strong social component of entrepreneurship increases the probability of firm success.<sup>36</sup> Prior literature indicates that entrepreneurs who spend time and energy developing and crafting their social networks achieve superior business outcomes given their investment in building personal and professional relationships.<sup>37</sup>

Greve and Salaff's 2003 study examines social networks and entrepreneurship with a secondary focus on women entrepreneurs. According to the authors, although entrepreneurs may have the requisite ideas and knowledge to run a business, they require complementary resources,<sup>38</sup> usually via social networks given gender discrimination that many encounter. This is logical given the role of social networks as the critical component of entrepreneurial capital and know-how acquisition. As Kane suggests too, this "network know-how, itself a cultural form, is in turn shaped by a variety of other cultural factors" and the most relevant factors are the culturally based gender norms that may influence network transition and ability to access and achieve favorable outcomes<sup>39</sup>. Successful entrepreneurs often tailor their social networks to supplement their knowledge, education, skills, and expertise such that the success of their business ventures is more likely.<sup>40</sup> Social networks are dynamic and can both influence and be influenced by particularly gendered variables or individuals.

Given the dynamic nature of entrepreneurial social networks, Klyver, et. al. used Global Entrepreneurship Monitor (GEM) data to examine the influence of social networks on entrepreneurial participation across gender. This study found that men and women have structurally different social networks, where women's networks typically include more women. Further, women were less likely to have entrepreneurs in their network, an important fact given their finding that "personally knowing an entrepreneur was a significant predictor of entrepreneurial participation."<sup>41</sup> As such, women were less likely to report entrepreneurial networking than men, an attribute that persisted across all phases of entrepreneurship. Among the study's chief conclusions, the researchers found that the effect of entrepreneurs in a social network is similar for both men and women.

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<sup>34</sup> Kane, D. (2010). *The Gendered Transition to College: The Role of Culture in Ego-Network Evolution*. *Poetics*. 39: 266-289.

<sup>35</sup> Stuart, op. cit.

<sup>36</sup> Leyden, Dennis P. Link, Albert N. Siegel, Donald S. *A Theoretical Analysis of the Role of Social Networks in Entrepreneurship*. UNC Greensboro. December 16, 2013.

<sup>37</sup> McQuaid, op. cit.

<sup>38</sup> Complementary resources include but are not limited to financial capital, additional human capital, intellectual capital, and social capital.

<sup>39</sup> Kane, op. cit.

<sup>40</sup> McQuaid, op. cit.

<sup>41</sup> Klyver, Kim. Grant, Sharon. Hindle, Kevin. *The Influence of Social Network Structure on Entrepreneurial Participation: Gender Differences Across 47 Countries*. University of Southern Denmark.

Robinson and Stubberud studied the gender differences in entrepreneurial social networks using European Union data on entrepreneurs' sources of advice. The study highlighted the importance of social networks to business success, noting that "networks provide business owners with direct access to the resources necessary to establish and grow a business." Further, the authors stressed that social networks may provide indirect access to third party connections and their resources. Robinson and Stubberud's results indicated that women are more likely than men to list friends and family as advisors and men were more likely than women to list professional acquaintances and consultants as sources of business advice. The authors note that this difference has implications for gender-segregated business performance outcomes as the informal networks most used by women entrepreneurs are likely to be less useful than the professional networks utilized by male entrepreneurs.<sup>42</sup>

Burt, building on Granovetter, writes about social capital and the strategy of "borrowing" social capital through the use of network relations. Burt captures the importance of social capital and suggests as other researchers have that contacts that lead to successful outcomes are social capital in and of themselves – they are the set of "tangible or virtual resources that accrue to actors through the social structure."<sup>43</sup> As Burt notes when specifically discussing entrepreneurial use of social networks,

"entrepreneurial networks are optimum for senior men...the fact that women and entry-rank men fall behind when they build their own social capital, and move ahead when they borrow social capital, indicates that they have a legitimacy problem in this firm. It is one thing to occasionally borrow social capital to succeed in a new venture. It is another to have to borrow social capital for all your ventures."

The research posits that if borrowing social capital is a strategy through which new entrepreneurs gain access to resources, social and financial capital, those entrepreneurs are perceived as less established, more risky and potentially less successful. Analyzing the exchange of social capital, according to Burt, provides more than a method of identifying groups of people described as outsiders or who are trying to jump-start their entrepreneurial endeavor. Rather, he argues that cultural assumptions about broad attributes of age, race, and gender could be ameliorated by an examination of other social network components and the social context in which networks are immersed.<sup>44</sup> The focus on gender composition and diversity in entrepreneurial networks and the use of SNA itself to investigate the strength and efficacy of those networks to enhance outcomes is an essential factor in any contemporary research on these issues.

Based upon existing research, it is less clear how different forms of social capital affect existing gender differences. Important insight has come from knowledge generated from case-study research in particular industries,<sup>45</sup> but quantitative accounts examining how exposure to

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<sup>42</sup> Robinson and Stubberud, op. cit.

<sup>43</sup> Greve and Salaff, op. cit.

<sup>44</sup> Burt, R. (1999). *The Gender of Social Capital*. Selected Paper 80. The University of Chicago.

<sup>45</sup> Grugulis, I., and D. Stoyanova. (2012). *Social Capital and Networks in Film and TV: Jobs for the Boys?*. *Organization Studies* 33(10):1311–31.



different types of network structures affect gender disadvantages in career advancement remain limited in studies of nascent entrepreneurial endeavors. Petersen, Saporta, and Seidel (2000)<sup>46</sup> reviewed the empirical literature on networks and gender segregation and observe that systematic knowledge is still very limited. They cite Granovetter, who notes in his review that this research gap is precisely the one “most in need of filling”.<sup>47</sup> Peterson et. al. argue that the few existing studies that deal explicitly with the differential returns of social capital (as understood in particular with respect to entrepreneurship and startup careers for men and women) are mixed and inconclusive in their findings.

While Burt has argued that women “do better with a small network of interconnected contacts” and do not profit from brokerage per se (as men do), women can benefit indirectly from brokerage through strong ties to established business and network sponsors. Others, however, argue that women’s close circles are detrimental to their careers. As Lutter (2015) cites, “women’s gender-homophilous ties (i.e., exchange occurs mainly through ties with the same sex) create stronger disadvantages because they tend to be lower in status and consist of fewer connections to important sponsors.”<sup>48</sup> While contemporary research recognizes the need to investigate context and to be cautious about “essentializing” any characteristics of women in business, certain key factors seem particularly relevant to their success as entrepreneurs.

Social capital assists entrepreneurs in accessing information, knowledge, financial, and other critical resources. Peltier and Naidu performed a 2012 study of 297 small to medium business owners in two Indian cities to investigate the evolution of the entrepreneurs’ social networks as their small businesses progressed through the organizational lifecycle in an effort to ascertain the effects of social networks on organizational performance. They found that the frequency of strategic advice from family and friends during the startup and planning stages was significantly higher than other network components, such as business associates. As such, the study concluded that small business social networks change as firms transition through the startup period to the growth period in order to meet varying entrepreneurial and business needs.<sup>49</sup>

Social networks are critical to gaining access to valuable resources and secondary knowledge. According to Shirokova and Arepieva, social networks “provide entrepreneurs with a vast range of valuable resources that are not owned by the entrepreneur but may help achieve entrepreneurial goals.”<sup>50</sup> Social networks open entrepreneurs to new information, financial resources, and professional advice.<sup>51</sup> However, gender differences remain. In examining the expectations of nascent entrepreneurs, Manolova et al. found that men-owned and women-owned firms differed in terms of human capital, social capital, financial capital, strategy, industry sector,

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<sup>46</sup> Petersen, Trond, Ishak Saporta, and Marc-David L. Seidel. 2000. *Offering a Job: Meritocracy and Social Networks*. American Journal of Sociology 106(3):763–816.

<sup>47</sup> Granovetter, Mark S. (1995). *Getting a Job: A Study of Contacts and Careers*. University of Chicago Press.

<sup>48</sup> Lutter, M. (2015). *Do Women Suffer From Network Closure? The Moderating Effect of Social Capital on Gender Inequality in a Project-Based Labor Market 1929-2010*. American Sociological Review. 80(2): 329-358.

<sup>49</sup> Peltier, James W. Naidu, G.M. *Social Networks Across the SME Organizational Lifecycle*. Journal of Small Business and Enterprise Development, Volume 19, No. 1. 2012.

<sup>50</sup> Shirokova, op. cit.

<sup>51</sup> Ibid.

and personal motivations.<sup>52</sup> In our research we build upon this observation and utilize the entrepreneurial expectancy framework as outlined in their study.

In addition we include insight from recent research that incorporates a focus on gender in the examination of entrepreneurship.<sup>53</sup> Yang and Aldrich (2014) examine how achieved status and ascribed attributes such as gender, jointly affect the successful outcomes of the entrepreneurial endeavors of teams. The authors conclude that even when merit is a significant consideration, gender stereotypes continue to constrain female entrepreneurs' access to leadership positions, power, social capital, and resource availability. One critical conclusion is that these disadvantages and the effect of gender are *heightened* when spouses are involved in the nascent firm as well as the presence and timing of children. This study is informative for our own as the authors note two mechanisms that could enhance the context and social network in which women entrepreneurs are immersed. Specifically *new* businesses may be seen as offering a better balance between work and family for women and therefore more opportunities for women may exist. Secondly, this research builds on others to suggest that formal sector wage penalties may exist for women who have children, thus motivating women to pursue careers and the establishment of new businesses. Yang and Aldrich utilize the Panel Study of Entrepreneurial Dynamics (PSED) in order to investigate the interplay between concepts of merit and gender in entrepreneurial team leadership. Their study is a contemporary and fundamental step in analyzing the role of gender in organizational research.

Entrepreneurs require a host of information, skills and access to labor in order to start a business and sustain firm activities over the long-term. While a nascent entrepreneur will ideally possess the financial capital to launch the venture, complementary resources and contacts are essential. These resources are embedded within the multi-faceted social network in which the entrepreneur is immersed, but are neither static, nor comprised solely of ties with solitary meanings. Social network analysis is by its very nature the investigation of dialectical relationships that are in themselves, immersed in wider, contextual and historical processes. In this investigation we have examined one the most influential and yet still understudied factors – the role of gender in crafting strategies for entrepreneurial success using social network analysis.

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<sup>52</sup> Manolova, Tatiana S. Brush, Candida G. Edelman, Linda F. *What do Women (and Men) Want? Entrepreneurial Expectancies of Women and Men Nascent Entrepreneurs.* Frontiers of Entrepreneurship Research. 2007.

<sup>53</sup> Yang, Tiantian and Howard E. Aldrich. (2014). *Who's the Boss? Explaining Gender Inequality in Entrepreneurial Teams.* American Sociological Review. Vol. 79 (2): 303-327.

### 3. Research Design and Methodology

The existing literature and prior research provide a sound basis and foundation for exploring the use of social networks by entrepreneurs at a nascent stage. Our research design includes positing two research hypotheses related to gender differences in social network use during the firm creation process. We test these hypotheses using multivariate regression that follows an expectancy theory model with data from the Panel Study of Entrepreneurial Dynamics. In this section, we discuss our primary data source, followed by our research hypotheses. Our research hypotheses extend from the key concepts of social network analysis and required the development of specific data variables designed to capture the impact and role of social networks on entrepreneurial efforts. We provide key variable definitions, as well as a general overview of the variables we constructed from the PSED data. For additional information on definitional and technical aspects of our research design, Appendix A contains a data glossary, while Appendix B contains detailed technical information on how we constructed our social network variables.

#### *Data Source*

The Panel Study of Entrepreneurial Dynamics is the first full scale realization of a longitudinal approach to the systematic, large scale study of entrepreneurs and the process of venture startup.<sup>54</sup> Administered by the University of Michigan, Institute for Social Research, the PSED program is “designed to enhance the scientific understanding of how people start businesses.”<sup>55</sup> The PSED covers two different survey cohorts, PSED I and PSED II. PSED I began screening in 1998-2000 to select a cohort of 830 firms with three follow-up interviews. The PSED II began screening in 2005-2006 to select a cohort of 1,214 firms with five follow-up interviews. The cohort of 1,214 firms completed one hour interviews detailing their startup initiatives for the first wave. The PSED II is a nationally representative dataset offering systematic, reliable, and generalizable data on how businesses form.<sup>56</sup> The survey design focuses on four central questions:

- Who is involved in starting businesses in the United States?
- How do they go about the process of starting companies?
- Which of these business startup efforts are likely to result in new firms?
- Why are some of these business startup efforts successful in creating high-growth businesses?

A key feature of the PSED II is that the data, questionnaires, and codebooks are available for public download in SPSS and SAS formats.<sup>57</sup> This research study utilizes public PSED II data, which include characteristics of startup efforts that become firms. The PSED II data are

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<sup>54</sup> Davidsson, Per. and Gordon, Scott R. (2012). *Panel Studies of New Venture Creation: a Methods-Focused Review and Suggestions for Future Research*. Small Business Economics, 39(4). p. 853-876.

<sup>55</sup> <http://www.psed.usr.umich.edu/psed/home>

<sup>56</sup> Reynolds, Paul D. Curtin, Richard. *Panel Study of Entrepreneurial Dynamics II*. Kauffman Symposium on Entrepreneurship and Innovation Data. <http://ssrn.com/abstract=1023086>

<sup>57</sup> For more information, please see <http://www.psed.isr.umich.edu/psed/data>

widely-used in the literature in the study of business inception through early operations. We elected to use the PSED as it includes many variables that explore entrepreneurs' social networks, including the number and utility of business contacts.

### ***Empirical Models and Hypothesis Introduction***

Expectancy theory is a dominant theoretical framework for explaining human motivation.<sup>58</sup> The theory explains motivation based on three aspects of relationships and outcomes; expectancy (efforts will yield desired goals), valence (the worth and value of those goals), and instrumentality (the effort and outcomes are worthwhile overall) and is well-grounded in empirical research. The focus of this research project covers two research hypotheses using PSED II data and expectancy theory tailored to an analysis of the structure and role of social networks in assisting nascent entrepreneurs.

*H1: In the entrepreneurial expectancy framework, desired outcomes for starting a new business are positively influenced by the entrepreneurs' social network intensity (i.e., motivations using social networks).*

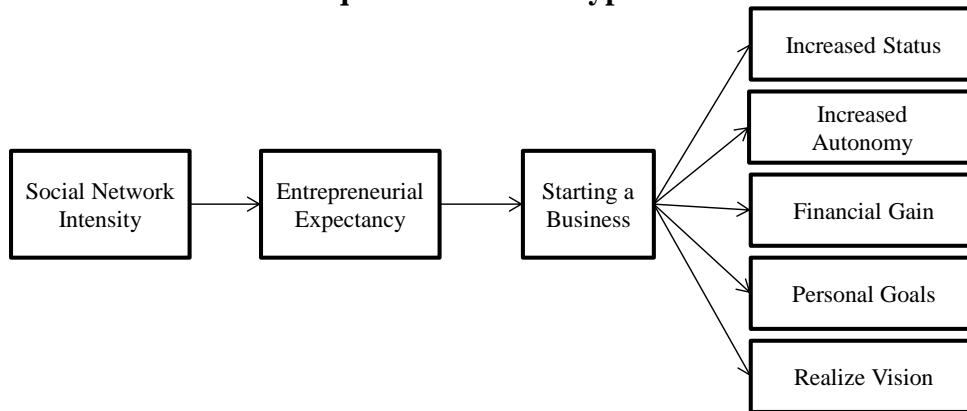
*H2: There are significant, observable differences in social network intensity between female and male entrepreneurs when achieving desired outcomes.*

Combined with univariate statistics, the research plan undertaken provides insight on the structural characteristics of female entrepreneurs' social networks. Further, this work explores differences in success along gender lines, and also where opportunities exist for female entrepreneurs to expand and broaden their entrepreneurial social networks. We are interested in the social network component of how women launch their businesses and what they hope to achieve in doing so. Our analysis covers a specific point early in the entrepreneurial process and all results are based on the data contained within the PSED II. For that reason, it is not appropriate to generalize the results or methodology outlined in this report to entrepreneurs at every stage of their businesses. Figure 3-1 shows the structural equation model used to test hypotheses 1 and 2. Arrows indicate hypothesized causal relationships, such that social network intensity affects entrepreneurial expectancy which in turn affects starting a business. Starting a business affects desired outcomes.

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<sup>58</sup> Manolova, Tatiana S. Brush, Candida G. Edelman, Linda F. (2007) *What do Women (and Men) Want? Entrepreneurial Expectancies of Women and Men Nascent Entrepreneurs*. Frontiers of Entrepreneurship Research.

**Figure 3-1**  
**Structural Equation Model – Hypotheses 1 and 2**



Structural equation modeling (SEM) is a general term to describe a group of linked statistical models used in hypothesis testing. Sample size is an important consideration when performing econometric SEM analyses as SEM is most appropriate for large samples ( $N > 200$ ). The theory stipulates that causal relationships exist among multiple variables. To describe relationships between variables, SEM incorporates both a path model and a measurement model. Path models are defined by the hypothesized directional influences or causal relationships between variables. A key feature of SEM is that variables can serve as both source (independent) and result (dependent) variables at the same time. For example, in our model, social network intensity influences entrepreneurial expectancy which influences starting a business. In this model, entrepreneurial expectancy acts as both a dependent and an independent variable at separate but linked stages in the analysis.<sup>59</sup>

In testing each hypothesis with PSED data, key variables include owner gender, type of business, education, legal form, startup experience, work experience, industry experience, and network resource provision. A series of key independent variables comprise the social network intensity, which we created using a combination of PSED variables to gauge the level of social capital and the number of contacts an entrepreneur has in their network. In turn, our dependent variables are desired outcomes, which include increased status, increased autonomy, financial gain, personal goals, and realization of a vision, all of which are developed using several Likert scale variables.<sup>60</sup> Using Likert scale variables allows us to quantitatively compare the intensity with which each entrepreneur pursued a particular desired outcome, with a higher score equating to a higher intensity. In the PSED survey, the entrepreneurs rated their intensity on each outcome on a 1 to 5 scale. We discuss each of these in turn.

- Increased status: the entrepreneur started the business to elevate their social status. The variables used include:

<sup>59</sup> For more on SEM theory and application, please see [http://www.ats.ucla.edu/stat/seminars/muthen\\_08/part4.pdf](http://www.ats.ucla.edu/stat/seminars/muthen_08/part4.pdf)

<sup>60</sup> Likert scales represent a method of ascribing quantitative value to qualitative data, to make it amenable to statistical analysis. A numerical value is assigned to each potential choice and a mean figure for all the responses is computed at the end of the evaluation or survey. Likert scales usually have five potential choices (strongly agree, agree, neutral, disagree, strongly disagree).

- To achieve a higher position in society
  - To be respected by your friends
  - To achieve something and get recognition for it
  - To have the power to greatly influence an organization
- Increased autonomy: the entrepreneur started the business in order to increase their personal and/or professional autonomy. The variables used include:
    - To have greater flexibility for your personal and family life
    - To have considerable freedom to adapt your own approach to work
- Financial gain: the entrepreneur started the business to realize a financial gain. The variables used include:
    - To give yourself, your spouse, and your children financial security
    - To earn a larger personal income
    - To have a chance to build great wealth or a very high income
- Personal goals: the entrepreneur started the business for personal and/or family reasons. The variables used include:
    - To continue a family tradition
    - To follow the example of a person you admire
    - To build a business your children can inherit
- Realize vision: the entrepreneur started the business to realize a personal and/or professional vision. The variables used include:
    - To develop an idea for a product
    - To fulfill a personal vision

In our structural equation model, starting a business is a stage 2 dependent and stage 3 independent variable, relating entrepreneurial expectancy and desired outcomes. Consistent with prior research (Manolova et al. 2007), we define starting a business using the Likert scale variable “overall, my skills and abilities will help me start this new business.” In this research, we adopt an expectancy theory framework. Entrepreneurial expectancy (EE) is the belief that a particular action will be followed by a particular outcome. Previous research (Manolova et al. 2007) used PSED I data to explore the effect of expectations on starting a business and the effect of starting a business on desired outcomes and defined a particular entrepreneur’s entrepreneurial expectancy. In this research, we define entrepreneurial expectancy using Likert-scale responses to three PSED II variables:

- Overall, my skills and abilities will help me start this new business.
- My past experience will be very valuable in starting this new business.
- I am confident I can put in the effort needed to start this new business.

## *Key Data Definitions*

Throughout the remainder of this report, we adopt the language used in the PSED questionnaire to discuss the individuals with which the primary entrepreneur interacts as part of the business formation process (i.e., their social network). For a complete listing of the variables and methodologies used to create the new variables discussed below, please see the Technical Appendix. Key terms used throughout the report include:

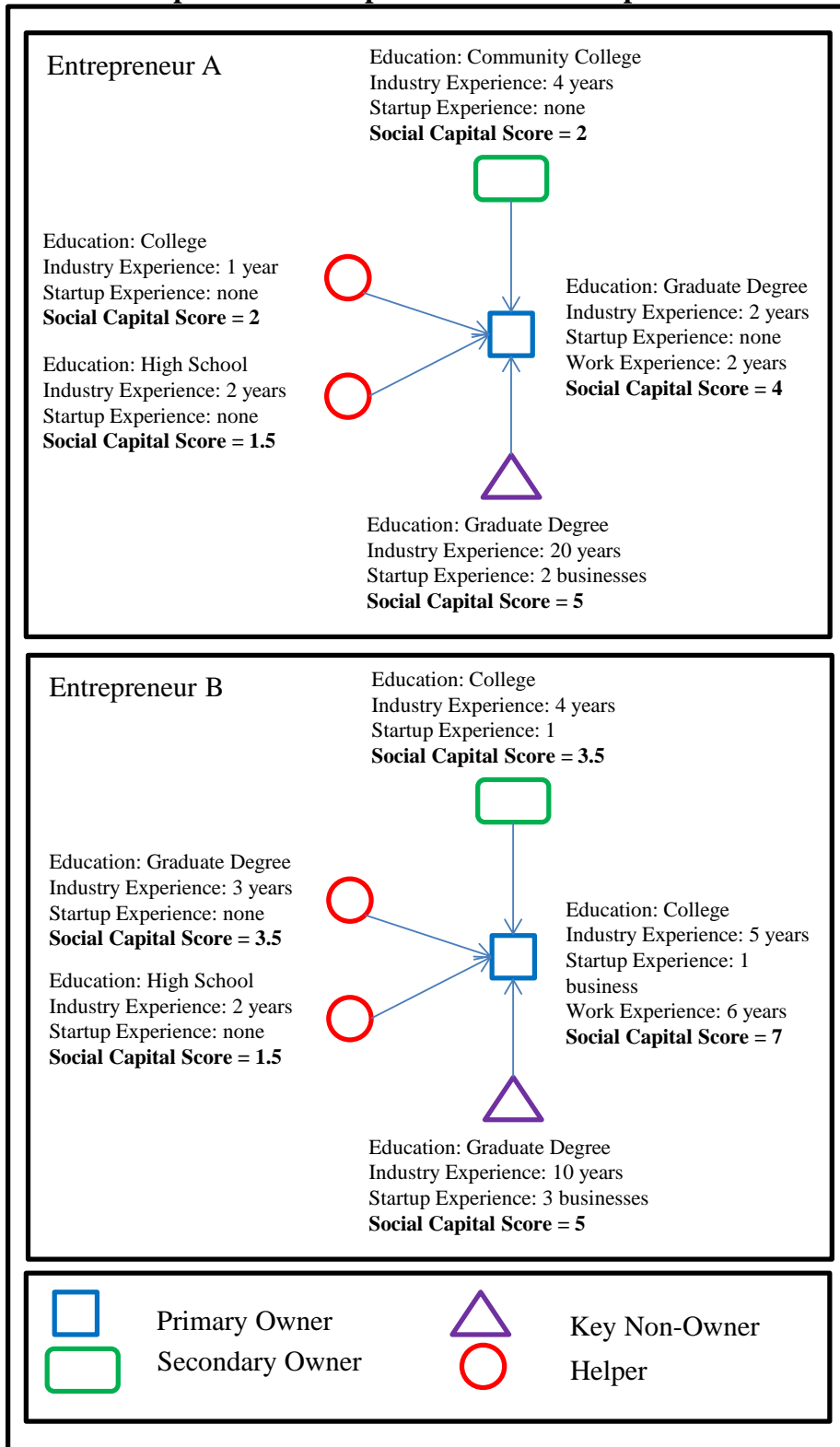
- Primary owner: the individual identified in the PSED data as the leading owner of the business. This is the individual that responded to the survey.
- Secondary owner: individual identified in the PSED as an equity holder in the business that is not the primary owner. For example, a business partner that does not lead the everyday operations of the firm is a secondary owner. Other options include family and friends who invested in the business. Not all firms in the sample have secondary owners.
- Key non-owner (KNO): individual that does not own an equity stake in the business, but made a distinctive contribution to founding the business. Examples of contributions include planning, development, and provision of financial resources, materials, training, or business services. Not all firms in the sample have key non-owners.
- Helper: individual that does not own an equity stake in the business, but provides significant support, advice, or guidance to the owners on a regular basis. The provision of assistance on a regular basis in the form of non-professional services contrasts key non-owners, who provide professional services. Not all firms in the sample have helpers.

When evaluating entrepreneurial social networks, understanding network composition, both in terms of quality and quantity of contacts is germane. For example, an entrepreneur with three contacts, all of which are educated and have substantial industry experience, may have a better entrepreneurial social network than an entrepreneur with ten contacts, none of which have industry or startup experience. To gain a greater understanding of the dynamics of individuals that comprise an entrepreneur's social network, we constructed a social capital score for each owner (primary and secondary), key non-owner, and helper. We define social capital as the combination of industry experience, startup experience, education, and work experience an individual owns.<sup>61</sup> Figure 3-2 gives a hypothetical example of social capital scores and network components for two entrepreneurs, A and B.

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<sup>61</sup> Work experience is only available for primary and secondary owners.

**Figure 3-2  
Development of Entrepreneurial Social Capital Scores**





As shown, both Entrepreneur A and B have one secondary owner, one key non-owner, and two helpers. To that end, Entrepreneurs A and B have the same network size. However, the qualities of the individuals that comprise Entrepreneur A's and B's networks differ. First, Entrepreneur A has more education, but less industry and startup experience than Entrepreneur B, resulting in an overall lower social capital score (4 versus 7). In theory, Entrepreneur B's helpers have a higher capability to provide assistance than Entrepreneur A's helpers as they have greater than or equal to social capital scores. We developed these metrics for the entire sample of 1,214 entrepreneurs. Despite the quality of the network ties that comprise an entrepreneur's social network, it is incumbent upon the entrepreneur to effectively leverage the skills and talents of network members. That is, although an entrepreneur may have a theoretically strong social network, if they do not actively tap their social network to achieve entrepreneurial goals, the network is not valuable.

We developed a network number score for each entrepreneur as a means to compare the number of secondary owners, key non-owners, and helpers. The final key term germane to our econometric analysis is social network intensity (SNI). Within the PSED data, we define social network intensity as a combination of the number of individuals in an entrepreneur's network and the owner, key non-owner, and helper social capital. The social capital scores discussed in Figure 3-2 as well as the number of contacts within an entrepreneur's social network comprise their social network intensity. That is, the quantity and quality of individuals within an entrepreneurial social network define its social network intensity. The technical appendix (Appendix B) outlines the algorithm used to calculate the social capital and network number scores as well as the variables used to carry out these calculations.

Given the focus of this project on women entrepreneurs, correctly identifying women-owned businesses is essential. We explored several definitions for firm ownership based on gender. Consistent with prior research,<sup>62</sup> we elected to consider the gender of the survey respondent, who is considered the primary owner within the context of the PSED II. If the respondent was a woman, we classified the firm as a women-owned business (WOB). As there were only two choices for primary owner gender within in the PSED, firms that were not women-owned were classified as men-owned businesses (MOBs). The resulting gender split in the PSED II sample is 37.6 percent WOB and 62.4 percent MOB.<sup>63</sup>

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<sup>62</sup> Manolova, et al., op. cit.

<sup>63</sup> The percentages given are weighted based on the survey design of the PSED. There are 453 WOBs and 761 MOBs in the sample.

## 4. Results

As discussed above, social capital is an essential construct for understanding an entrepreneur’s social network intensity in the framework of the PSED. Table 4-1 contains summary statistics for all social capital components by network participant (owner 1, key non-owners, helpers) by primary owner gender (WOB, MOB). On average, owner 1 has over 19 years of work experience whether female or male. A difference in owner 1 social capital contributions is industry experience, where men have higher average industry experience. The average owner education score is between 5 and 6 for all network members, corresponding to the “some college” and “community college degree” categories in the PSED II codebook.<sup>64</sup>

**Table 4-1**  
**Summary Statistics for Social Capital Components by Network Member**

	WOB				MOB			
	Mean	Median	Standard Deviation	Sample Size	Mean	Median	Standard Deviation	Sample Size
<i>Owner 1</i>								
Education	5.66	5.00	1.96	453	5.45	5.00	2.22	759
Industry Experience (years)	7.10	3.00	9.06	449	10.74	7.00	11.20	760
Startup Experience (number of businesses)	0.86	0.00	1.69	453	1.11	0.00	2.07	760
Work Experience (years)	19.51	20.00	11.59	451	21.82	21.00	12.92	753
<i>Key Non-owners</i>								
Education	5.53	5.00	2.10	150	5.34	5.00	2.22	217
Industry Experience (years)	7.53	3.33	9.86	154	7.90	4.67	9.65	235
Startup Experience (number of businesses)	1.98	1.00	8.04	146	1.30	1.00	1.94	217
<i>Helpers</i>								
Education	5.22	5.00	1.94	107	5.32	5.00	2.26	182
Industry Experience (years)	8.78	3.00	11.97	119	8.27	5.00	10.40	207
Startup Experience (number of businesses)	2.10	1.00	9.45	105	1.41	1.00	2.07	186

We calculated the distribution of network members (owners, helpers, key non-owners) to ascertain differences in network composition through a quantity lens. That is, we explored how the number of network members differs by primary entrepreneur gender. The results are shown in Table 4-2.

<sup>64</sup> The PSED ranks educational attainment on a 1 to 10 scale, where 1 corresponds to “up to eighth grade” and 10 corresponds to “law, MD, PhD, EDD degree.” For more information, see <http://www.psed.isr.umich.edu/psed/data>

**Table 4-2**  
**Distribution of Social Network Member Quantity – WOB vs. MOB**

<b>Number of Owners</b>	<b>WOB</b>	<b>MOB</b>
1	53.9%	50.5%
2	35.1%	35.5%
3 or more	11.0%	14.1%
<i>Sample Size</i>	453	761
<b>Number of Helpers</b>	<b>WOB</b>	<b>MOB</b>
0	65.3%	66.1%
1	15.9%	13.2%
2	11.4%	10.0%
3 or more	7.4%	10.7%
<i>Sample Size</i>	447	749
<b>Number of Key Non-owners</b>	<b>WOB</b>	<b>MOB</b>
0	57.3%	61.8%
1	21.7%	16.8%
2	10.3%	10.1%
3 or more	10.7%	11.3%
<i>Sample Size</i>	447	744
Note: sample sizes slightly differ due to non-response		

Table 4-2 shows that women are slightly more likely than men to operate with only one owner, where approximately 54 percent of WOBs and 51 percent of MOBs are sole proprietorships. However, more MOBs have 3 or more owners than WOBs. Similar trends exist for the number of helpers, where approximately 65 percent of WOBs and 66 percent of MOBs used no helpers when launching their new businesses. WOBs were slightly more likely than MOBs to use key non-owners. Among those that had helpers, the average number of helpers for WOBs was 2.57 and 2.62 for MOBs, with no statistically significant difference. Similarly, among those entrepreneurs that used key non-owners, the average number of key non-owners was 2.84 for WOBs and 2.40 for MOBs, with no statistically significant difference. It is possible that a single entrepreneur may elect to use any combination of secondary owners, helpers, and key non-owners in their network. However, approximately 16 percent of both WOBs and MOBs had no secondary owners, no helpers, and no key non-owners for the entrepreneurial endeavor reported in the PSED. We discuss solo entrepreneurs in detail later in the results section.

The inclusion of industry experience as an indicator of social capital raises the question whether we observe differences in the particular industries female entrepreneurs concentrate in compared to male entrepreneurs. Table 4-3 presents the distribution of firms by line of business using PSED II data. The data indicate that women are much more likely than men to operate in the health, education, social services, retail, or insurance sector. Women are twice as likely as men to operate retail stores and more than three times as likely to operate businesses in the health, education, or social services sectors. As anticipated, these are industries that are typically and anecdotally associated with women. Conversely, men are much more likely to operate in construction, wholesale distribution, and finance.

**Table 4-3**  
**Distribution of Firms by Line of Business and Gender Ownership**

<b>Line of Business</b>	<b>All Businesses</b>	<b>WOB</b>	<b>MOB</b>
Retail Store	13.9%	19.0%	10.8%
Restaurant, tavern, bar, nightclub	4.5%	3.1%	5.4%
Customer or consumer service	34.5%	35.6%	33.9%
Health, education or social services	6.8%	12.0%	3.6%
Manufacturing	4.1%	3.5%	4.5%
Construction	6.6%	3.1%	8.8%
Agriculture	3.8%	3.1%	4.2%
Mining	0.2%	0.2%	0.2%
Wholesale distribution	5.1%	3.3%	6.1%
Transportation	1.6%	1.1%	2.0%
Utilities	0.1%	0.0%	0.2%
Communications	2.9%	2.9%	2.9%
Finance	1.7%	0.9%	2.1%
Insurance	0.8%	1.3%	0.5%
Real estate	5.6%	5.7%	5.6%
Business consulting or service	7.5%	4.9%	9.0%
Don't know	0.3%	0.3%	0.3%
<i>Total</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>
<i>Sample Size</i>	<i>1214</i>	<i>453</i>	<i>761</i>

Previous research indicates that ownership structure and legal organization affect business growth and operations.<sup>65</sup> To that end, we calculated the distribution of legal organization by gender to probe differences, as shown in Table 4-4. WOBs are much more likely than MOBs to operate as sole proprietorships. In theory, having multiple owners could be an important network for nascent entrepreneurs, particularly during the startup phase. Further, MOBs are nearly three times as likely to operate as S corporations,<sup>66</sup> an interesting finding given the role that incorporation plays in securing access to capital.<sup>67</sup>

**Table 4-4**  
**Legal Organization by Primary Entrepreneur Gender**

<b>Legal Organization</b>	<b>All Businesses</b>	<b>WOB</b>	<b>MOB</b>
Sole Proprietorship	35.9%	40.8%	32.9%
General Partnership	6.8%	6.9%	6.7%
Limited Partnership	2.2%	1.0%	3.0%
Limited Liability Corporation	10.5%	11.7%	9.8%
Sub Chapter S Corporation	4.7%	2.3%	6.2%
General Corporation	2.2%	2.1%	2.2%
Not Yet Determined	36.1%	33.9%	37.4%
Don't Know	1.6%	1.3%	1.9%
<i>Total</i>	<i>100.0%</i>	<i>100.0%</i>	<i>100.0%</i>
<i>Sample Size</i>	<i>1214</i>	<i>453</i>	<i>761</i>

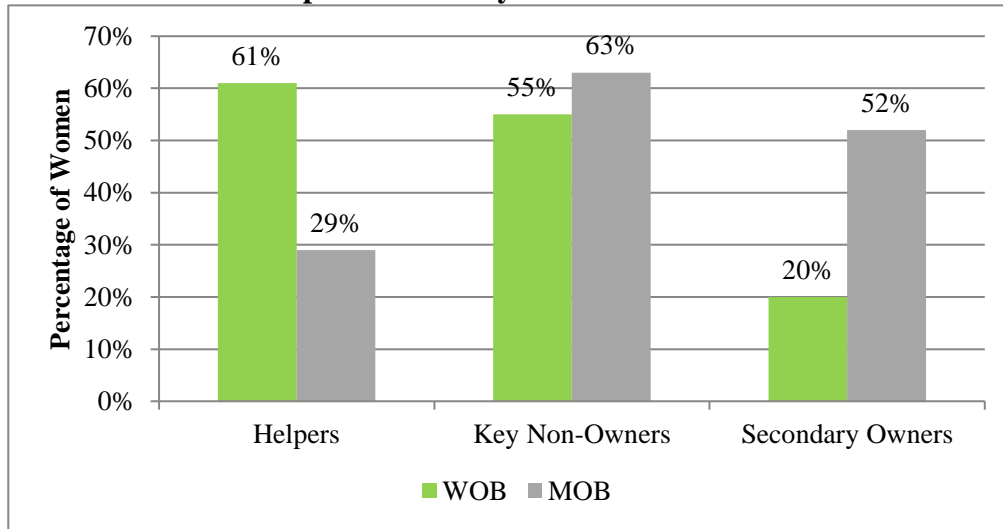
Understanding the composition and dynamics of entrepreneurial social networks along gender lines requires cataloging the gender of not only the entrepreneur, but also the individuals that comprise their social network. Understanding how women entrepreneurs use male helpers and key non-owners and how male entrepreneurs use women helpers and key non-owners is important to evaluating gender differences. We examined the gender of all secondary owners, key non-owners, and helpers for each entrepreneur. Figure 4-1 shows the distribution of social network members for both male and female entrepreneurs based on the percentage of helpers, key non-owners and secondary owners that are female.

<sup>65</sup> Upton, Lee O. III. Broming, Emma J. (2014) *Access to Capital by High-Growth Women-owned and Women-led Businesses*. National Women's Business Council. SBAHQ-13-M-0200.

<sup>66</sup> According to the Internal Revenue Service, an S Corporation is a corporation that passes corporate income, losses, deductions, and credits through to shareholders for federal tax purposes. For more information, please see <http://www.irs.gov/Businesses/Small-Businesses-&Self-Employed/S-Corporations>

<sup>67</sup> Upton, op. cit.

**Figure 4-1  
Gender Representation by Social Network Members**



The data indicate that women and men have a preference to use helpers of the same gender when starting their businesses. This contrasts the key non-owner gender distribution, where men are more likely than women to use women as key non-owners. However, the most striking difference exists for secondary owners. Secondary owners are critical to the entrepreneurial process and provide key insights into operation of the business as well as equity funding.<sup>68</sup> In the PSED II, only 20 percent of secondary owners of WOBs were female. For MOB, 52 percent of secondary owners are male.

Several analyses in our research and the literature focus on social network intensity by the gender of the primary entrepreneur. Table 4-5 shows difference in means testing results on the social capital components of secondary owners by gender. That is, what differences exist in social capital among network members by gender? An important consideration when reviewing Table 4-5 is that the PSED has no hierarchy of secondary owners. That is, secondary owners are not ranked by the responding owner. As a result, the structure of owner teams and the order in which the primary owner listed the secondary owners in the PSED could affect the statistical significance of the results. However, because we are unable to ascertain or impute a ranking for the secondary owners, we accept the data as-is. For example, we compare owner 3 to owner 3 in all cases.

<sup>68</sup> Secondary owners, by virtue of being owners, own equity in a business.

**Table 4-5**  
**Social Capital Components by Secondary Owner Gender**

	Male		Female		Difference	Significance
	Mean	Count	Mean	Count		
<b>Education (scaled)</b>						
Owner 2	5.40	323	5.60	224	-0.20	
Owner 3	5.86	83	5.14	49	0.71	*
Owner 4	5.60	42	5.46	24	0.14	
Owner 5	6.20	5	7.00	5	-0.80	
<b>Industry Experience (years)</b>						
Owner 2	8.19	332	5.10	220	3.08	***
Owner 3	9.12	85	3.39	51	5.73	***
Owner 4	5.57	42	6.33	24	-0.76	
Owner 5	5.40	5	3.00	4	2.40	
<b>Startup Experience (businesses)</b>						
Owner 2	1.17	317	0.70	222	0.47	***
Owner 3	1.23	80	0.36	47	0.86	***
Owner 4	1.28	39	0.65	23	0.63	*
Owner 5	0.60	5	0.60	5	0.00	
<b>Work Experience (years)</b>						
Owner 2	20.93	315	17.17	214	3.76	***
Owner 3	20.53	79	17.48	46	3.05	
Owner 4	21.46	39	17.30	23	4.16	
Owner 5	27.60	5	18.80	5	8.80	
Note: *** indicates significance at the 0.01 level, ** indicates significance at the 0.05 level, and * indicates significance at the 0.10 level						

An important consideration is that few firms have more than three owners and as such, the sample sizes for owners 4 and 5 are small. As shown in Table 4-5, there is little difference in the education level of secondary owners by gender. However, in terms of industry experience, the difference in industry experience of owners 2 and 3 based on gender is statistically significant, where the male secondary owners have more industry experience than women secondary owners. Additional gender-based differences exist in terms of startup experience and work experience. Male owners 2, 3, and 4 have more startup experience than their female counterparts. Further, male owner 2s have more work experience than their female counterparts. These results are informative when examining entrepreneurial social network composition, particularly given the gender differences that exist and the hypotheses posed relating to social network intensity and entrepreneurial expectancy and outcomes.

We examined statistically significant differences in social capital components of both key non-owners and helpers by gender. Table 4-6 contains our results. There is no statistically

significant difference by gender in education for key non-owners or helpers. Further, there is no statistically significant difference by gender for key non-owners and helpers in startup experience. However, there are statistically significant differences in industry experience for all three key non-owners and helpers profiled as part of the PSED II. Male key non-owners and helpers have more industry experience than their female counterparts, which has important implications for social capital scores and entrepreneurial social network intensity.

**Table 4-6**  
**Social Capital Components by Key Non-owner and Helper Gender**

	Key Non-owners					Helpers							
	Male		Female		Difference	Significance	Male		Female		Difference	Significance	
	Mean	Count	Mean	Count			Mean	Count	Mean	Count			
	Education					Education							
1	5.42	218	5.26	137	0.15			5.42	166	5.31	122	0.10	
2	5.57	100	5.58	85	-0.01			5.17	96	5.25	68	-0.08	
3	5.95	55	5.89	45	0.06			5.21	47	5.24	34	-0.02	
	Industry Experience					Industry Experience							
1	9.32	234	6.64	140	2.68	**		10.31	183	7.18	128	3.13	**
2	9.99	107	5.92	87	4.07	***		9.35	105	5.34	77	4.01	**
3	7.12	57	4.63	43	2.49	*		8.39	51	4.50	34	3.89	**
	Startup Experience					Startup Experience							
1	1.42	215	2.08	139	-0.66			1.73	166	1.64	119	0.10	
2	2.32	95	1.16	86	1.15			1.77	98	1.97	69	-0.21	
3	1.20	54	3.00	41	-1.80			0.83	48	3.39	33	-2.56	

Note: \*\*\* indicates significance at the 0.01 level, \*\* indicates significance at the 0.05 level, and \* indicates significance at the 0.10 level

Together with Figure 4-1, Table 4-6 shows that because women primary owners associate with women helpers, complemented by the fact that women helpers have lower social capital than their male counterparts, women entrepreneurs may not optimize their business opportunities and social networks with respect to helpers by aligning primarily with women helpers. Given the different social capital components by gender, working with secondary owners, helpers, and key non-owners of both genders is beneficial to entrepreneurial endeavors. This lends support to the notion that diverse networks are most advantageous to a nascent entrepreneur as different network ties can provide various services based on their skillsets.

Secondary owners, helpers, and key non-owners make contributions to nascent firms. Table 4-7 shows the percentage of firms that received assistance in a particular area from owners, helpers, and key non-owners, segmented by primary owner gender (WOB vs. MOB). In this analysis, we consider only those firms with multiple owners, helpers, or key non-owners for each category, such that firms with default zero values are excluded. The PSED II provides information on contributions in several categories: introductions, information, training, financial, physical resources, business services, personal services, and advice. Secondary owners were much more likely to provide services than helpers and key non-owners, consistent with the



numbers of firms with multiple owners, helpers, and key non-owners. Additionally, WOBs were less likely to receive financial assistance from secondary owners, but more likely to receive financial assistance from helpers and key non-owners. This has important implications for the critical issue of access to capital and demonstrates that women tap different financial resources than their male counterparts from a social network perspective when starting new firms. A potential avenue for future research on this point involves dissecting the connection between funding types and the different members of the social network that provided financial assistance.<sup>69</sup>

Further, WOBs were more likely to receive business services from secondary owners, but less likely to receive business services from helpers and key non-owners than MOBs. Our analysis shows that advice was the primary contribution from both helpers and key non-owners. WOBs were more likely to seek advice from key non-owners than MOBs, but less likely to seek advice from helpers.

**Table 4-7**  
**Social Network Contributions**

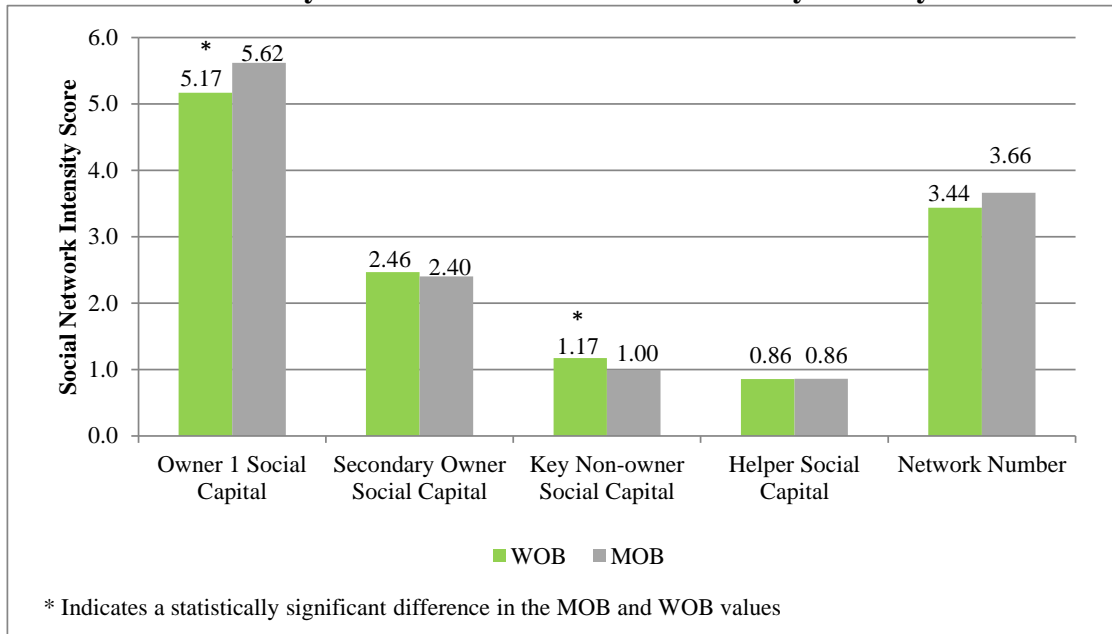
<b>Contribution</b>	<i>Owners</i>		<i>Helpers</i>		<i>Key Non-Owners</i>	
	<b>WOB</b>	<b>MOB</b>	<b>WOB</b>	<b>MOB</b>	<b>WOB</b>	<b>MOB</b>
Introductions	88.6%	84.0%	12.3%	7.4%	10.2%	11.9%
Information	96.6%	97.5%				
Training	65.7%	67.7%	12.4%	6.7%	11.9%	11.9%
Financial	39.6%	44.4%	9.7%	6.5%	22.4%	20.8%
Physical Resources	73.6%	68.5%	4.3%	13.0%	12.7%	12.2%
Business Services	65.3%	57.8%	9.3%	10.8%	9.4%	15.1%
Personal Services			8.7%	13.6%	6.8%	13.4%
Advice			51.0%	54.8%	42.3%	38.1%
<i>Sample Size</i>	209	377	155	254	191	284

Note: percentage of firms with secondary owners, helpers, or key non-owners that received a particular service. Those firms without secondary owners, helpers, or key non-owners are excluded from their respective samples.

<sup>69</sup> We examined data from the crowd-sourced CrunchBase data set ([www.CrunchBase.com](http://www.CrunchBase.com)). The data suggested that startups with at least one female founder or all female founders received less funding over a longer period of time compared to startups with only male founders, while controlling for founding or first funding date. CrunchBase however, is a crowd-sourced data set geared towards technology firms and there is a substantial selection bias and likely underrepresentation along gender and industry lines. Nevertheless, initial results highlight the need for additional research into causal factors explaining differences by gender, such as in funding avenues (i.e. among venture capital firms) or missed opportunities for network leverage by women entrepreneurs.

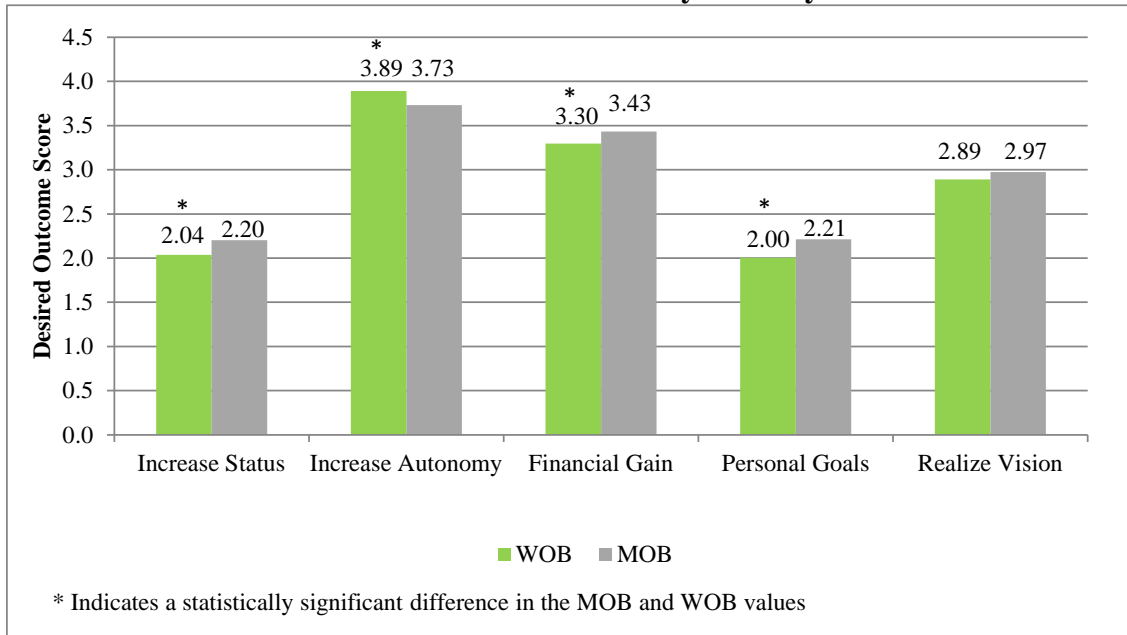
In addition to exploring the contributions made by entrepreneurs' social networks and in order to assess the causal effects of entrepreneurial social networks on desired outcomes, we performed difference in means testing on the social network intensity variables outlined in the data section. Figure 4-2 shows that male entrepreneurs have greater social capital than female entrepreneurs (owner 1 social capital). However, women leverage key non-owners with greater social capital, indicating that some women entrepreneurs may attempt to bridge their own social capital gaps by associating themselves with key non-owners with relevant skills.

**Figure 4-2**  
**Social Network Intensity Variables – Difference in Means by Primary Owner Gender**



Further, we examined differences in desired outcomes by primary entrepreneur gender. Figure 4-3 contains these results. Several statistically significant differences exist between female and male entrepreneurs. WOBs ranked “increased status” lower than MOBs as a desired outcome for starting their businesses. MOBs ranked “financial gain” as well as “personal goals,” as desire outcomes more highly than WOBs, an indication that men started their businesses for personal reasons more than women. The only desired outcome in which there was no statistically significant difference between men and women was “realizing a vision.”

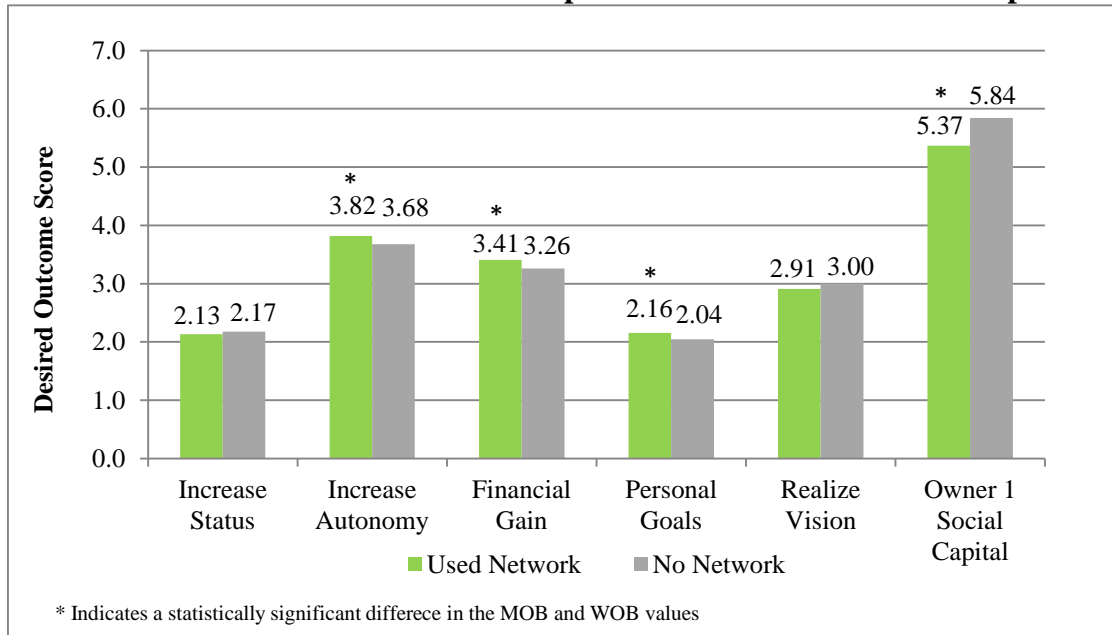
**Figure 4-3**  
**Desired Outcomes – Difference in Means by Primary Owner Gender**



*Solo Entrepreneurs*

We also explored differences among individuals that used networks and those that did not. We define individuals without a network as “solo entrepreneurs,” where the business had no secondary owners, no helpers, and no key non-owners. As solo entrepreneurs have no entrepreneurial social network, their helper and key non-owner social capital scores are zero. As such, the only relevant measure for comparison to networked individuals is owner 1 social capital and desired outcomes. In the PSED, approximately 16 percent of both men and women entrepreneurs operated totally solo (without a network). Figure 4-4 shows that there are statistically significant differences in desired outcomes and owner 1 social capital among solo and networked entrepreneurs.

**Figure 4-4**  
**Desired Outcomes and Owner 1 Social Capital – Solo vs. Networked Entrepreneurs**



Entrepreneurs without networks have higher owner 1 social capital than those that used networks, suggesting that entrepreneurs use network connections to bridge social capital gaps. In addition, there are statistically significant differences in networked and solo entrepreneurs in desired outcomes, where networked entrepreneurs more intensely pursue increased autonomy, financial gain, and personal goals when starting their businesses.

***Multivariate Model Results***

As outlined in the methodology section, we employed a three stage structural equation model (SEM) to test hypotheses 1 and 2. Table 4-8 contains model coefficients and their significance for hypothesis 1 for the entire sample of businesses.

**Table 4-8**  
**Multivariate Model – Hypothesis 1**

Path		All Businesses	
		Coefficient	Significance
Owner 1 Social Capital	--> Entrepreneurial Expectancy	0.0499	***
Secondary Owner Social Capital	--> Entrepreneurial Expectancy	-0.0016	
1 Key Non-owner Social Capital	--> Entrepreneurial Expectancy	0.0215	**
Helper Social Capital	--> Entrepreneurial Expectancy	0.0247	**
Network Number	--> Entrepreneurial Expectancy	0.0021	
2 Entrepreneurial Expectancy	--> Starting a Business	0.4556	***
Starting a Business	--> Increase Status	0.3200	***
Starting a Business	--> Increase Autonomy	0.2901	***
3 Starting a Business	--> Financial Gain	0.4692	***
Starting a Business	--> Personal Goals	0.2803	***
Starting a Business	--> Realize Vision	0.2554	***
Sample Size		1,203	
Note: *** indicates significance at the 0.01 level, ** indicates significance at the 0.05 level, * indicates significance at the 0.10 level			

Examining stage one, owner 1 social capital positively influences entrepreneurial expectancy. This result confirms the notion that increased industry, work, and startup experience are associated with confident entrepreneurs that expect their businesses to succeed. Owner 1 social capital is the key driver of entrepreneurial expectancy. As hypothesized, key non-owner social capital and helper social capital positively influence entrepreneurial expectancy. That is, increased key non-owner and helper social capital scores positively affect entrepreneurial expectations. An interesting result is that the network number, a scaled number representing the number of entrepreneurial network contacts, including secondary owners, key non-owners, and helpers, does not have a statistically significant effect on entrepreneurial expectancy. This suggests that quality is more important than quantity of network connections and that entrepreneurs do not necessarily need to network more, but need to network better and with individuals more equipped and aligned with their entrepreneurial goals.

Stage 2 of the model, the effect of entrepreneurial expectancy on starting a business is positive and significant, consistent with prior research.<sup>70</sup> Increased entrepreneurial expectations lead to increased belief in and propensity to start a business. Stage 3 explores the relationship between starting a business, influenced by social network intensity and entrepreneurial expectancy, and desired outcomes. We find that starting a business positively affects entrepreneurial propensity to seek increased status, increased autonomy, financial gain, achievement of personal goals, and realization of a vision. Together, the three stage SEM model indicates that within the entrepreneurial expectancy framework, desired outcomes are positively

<sup>70</sup> Manolova, et al., op. cit.

influenced by entrepreneurial social network components. Table 4-9 displays the results for hypothesis 2 multivariate testing.

**Table 4-9**  
**Multivariate Model – Hypothesis 2**

Path		WOB Only		MOB Only	
		Coefficient	Significance	Coefficient	Significance
Owner 1 Social Capital	--> Entrepreneurial Expectancy	0.0625	***	0.0429	***
Secondary Owner Social Capital	--> Entrepreneurial Expectancy	-0.0023		0.0012	
1 Key Non-owner Social Capital	--> Entrepreneurial Expectancy	0.0381	**	0.0109	
Helper Social Capital	--> Entrepreneurial Expectancy	0.0345	*	0.0221	*
Network Number	--> Entrepreneurial Expectancy	-0.0075		0.0048	
2 Entrepreneurial Expectancy	--> Starting a Business	0.4960	***	0.4292	***
Starting a Business	--> Increase Status	0.3550	***	0.2991	***
Starting a Business	--> Increase Autonomy	0.3248	***	0.2723	***
3 Starting a Business	--> Financial Gain	0.5161	***	0.4422	***
Starting a Business	--> Personal Goals	0.2341	***	0.3041	***
Starting a Business	--> Realize Vision	0.3423	***	0.2068	***
Sample Size		449		754	

Note: \*\*\* indicates significance at the 0.01 level, \*\* indicates significance at the 0.05 level, \* indicates significance at the 0.10 level

Looking at stage 1, the effect of social network intensity on entrepreneurial expectancy, the coefficient on owner 1 social capital for women is higher than that for men, indicating that the effect of owner 1 social capital on entrepreneurial expectancy is greater for women than for men. Said differently, having higher owner 1 social capital impacts entrepreneurial expectations of women more than men. Contrasting the significance of owner 1 social capital, secondary owner social capital does not influence entrepreneurial expectancy for male or female entrepreneurs, indicating that while primary owners may assemble business teams, they do not rely on the credentials and experience of their team members when addressing their expectations for the firm. Delving further into the independent variables in stage 1, non-equity contributors such as helpers and key non-owners are important to nascent entrepreneurs. Key non-owner social capital positively affects entrepreneurial expectancy for women entrepreneurs, but not for male entrepreneurs. However, helper social capital positively influences entrepreneurial expectancy for male and female entrepreneurs, although the relationship is only statistically significant at the 10 percent level.

The results above confirm hypothesis 2, as in stages 2 and 3, all relationships are statistically significant at the 1 percent level for both men and women entrepreneurs. Further, there exist statistically significant differences in social network intensity between male and female nascent entrepreneurs in the PSED II sample.<sup>71</sup>

<sup>71</sup> In addition to the multivariate models and results presented in Tables 4-8 and 4-9, we ran several additional conditional models using industry and legal organization control variables. Although the models were not statistically significant overall due to sample size issues, the individual model coefficients generally aligned with those presented here for the general population.

## 5. Conclusions

Existing literature supports the relevance and importance of social networks. In the entrepreneurial context, social networks enable movement of financial, human, and intellectual capital while facilitating information exchange. However, social network usage and efficacy vary substantially by gender and entrepreneurial phase and are driven by the quality and quantity of network participants. While existing research indicates that strong social networks positively affect overall success, inadequate social networks may act as a barrier to achieving desired outcomes, such as access to capital. As a result, there is a need to understand the dynamics of women's entrepreneurial social networks not only in the nascent phase, as addressed by this research, but also throughout the business lifecycle. A better understanding of the nexus between entrepreneurial efforts and use of social networks can provide critical information to female entrepreneurs in addressing entrepreneurial challenges.

Our study examined social network dynamics by gender for a large sample of U.S. firms that began operations in 2005. Specifically, we analyzed the effect of an entrepreneur's social network intensity on entrepreneurial expectancy and desired outcomes when starting the business. Key components of social capital that we identified and examined within the PSED were education level, industry experience, startup experience, and work experience. This work provides a structural and data-based mechanism for evaluating entrepreneurial social networks. We used PSED II data, which cover 1,214 entrepreneurial endeavors that commenced operations in 2005. The PSED is a well-established data set that contains information on primary owners, secondary owners, key non-owners, and business helpers, all of which contribute to business founding and success.

As part of our research design, we employed both univariate and multivariate analyses, tailored to an expectancy theory framework. We analyzed differences between women and men primary entrepreneurs and performed a thorough examination of the gender composition of entrepreneurial endeavors by primary entrepreneur gender. Key univariate results included the following:

- Women entrepreneurs were slightly more likely than male entrepreneurs to use key non-owners when starting their businesses.
- Approximately 54 percent of WOBs and 51 percent of MOBs have only one owner. While the difference is small, WOBs are more likely than MOBs to operate as sole proprietorships. In theory, having multiple owners could represent an important network for entrepreneurs, particularly during the startup phase. Further, MOBs are nearly three times as likely to operate as S corporations than WOBs.
- Only 16 percent of all businesses, both women-owned and men-owned, exhibited a lack of any network components. The remaining 84 percent of entrepreneurs in the PSED used some combination of secondary owners, key non-owners, or helpers when starting their new firms.

- On average, male primary owners had more industry experience than female primary owners.
- Men and women entrepreneurs within the PSED operate in different lines of business, consistent with the general business population. Women are much more likely than men to operate in the health, education, social services, retail, or insurance sectors. Further, women are twice as likely as men to operate retail stores and more than three times as likely to operate businesses in the health, education, or social services sectors.

Understanding the composition and dynamics of entrepreneurial social networks along gender lines requires cataloging the gender of not only the entrepreneur, but also the individuals that comprise their social network. As part of our research, we examined the gender of all secondary owners, key non-owners, and helpers for each entrepreneur and made the following conclusions:

- Women and men have a preference to use helpers of the same sex when starting their businesses.
- The propensity to use same-gender helpers contrasts the key non-owner gender distribution, where men are more likely than women to use women as key non-owners.
- The most striking difference in network gender composition exists for secondary owners, which are critical to the entrepreneurial process and provide key insights into operation of the business. Within the dataset, only 20 percent of secondary owners of women-owned businesses were female. This contrasts men-owned businesses, where secondary owners had a more even gender split of 52 percent male, 48 percent female.

An essential component of this quantitative research was the development of a set of variables that capture social capital inputs regarding an entrepreneur's social network and individual characteristics. We defined social network intensity in terms of both *quality* and *quantity* of entrepreneurial network ties using the combination of primary owner, secondary owner, key non-owner, and helper social capital as well as the number of network connections, referred to as the network number score. Notable results included:

- Male primary entrepreneurs have statistically significant higher social capital than female primary entrepreneurs. However, there is no statistically significant difference in secondary owner social capital for women-owned and men-owned businesses.
- Key non-owners in women's entrepreneurial endeavors have greater social capital than those assisting men with their entrepreneurial endeavors. This is a key point, indicating that some women entrepreneurs may attempt to bridge their own social capital gaps by associating themselves with key non-owners with relevant skills.



- There is no statistically significant difference in helper social capital or the number of network contacts for female and male entrepreneurs.

Our multivariate analysis found that women were statistically less likely to start a business to increase their status, to achieve personal goals, and for financial gain. Conversely, women were more likely to start their businesses in order to increase their personal and professional autonomy, an important gender difference. An important control analysis in this research is the comparison of networked individuals to solo entrepreneurs. Using difference in means testing, we found that networked entrepreneurs more intensely sought increased autonomy, financial gain, and achievement of personal goals when starting new firms. There was no statistical difference in the desire to increase status or realize a vision. An interesting result of our social capital analysis of solo entrepreneurs is that on average, solo entrepreneurs have greater primary owner social capital than networked entrepreneurs, an important finding given the literature on filling entrepreneurial gaps using networks.

Understanding the desired outcomes within the context of the PSED, we investigated the effect of social network intensity on desired outcomes using a three-stage structural equation model tailored to expectancy theory for the overall entrepreneurial population. Key findings included:

- Primary owner social capital positively influences entrepreneurial expectancy, which in turn affects starting a business and desired outcomes. This result confirms the notion that increased industry, work, and startup experience are associated with confident entrepreneurs that expect their businesses to succeed. We find that primary owner social capital is the key driver of entrepreneurial expectancy.
- Consistent with hypothesis 1, key non-owner social capital and helper social capital positively influence entrepreneurial expectancy, starting a business, and desired outcomes. This indicates that although primary owner social capital is of paramount importance to entrepreneurial endeavors, other individuals within the network make important contributions via their social capital.
- An interesting result is that the network number, a scaled number representing the number of entrepreneurial network contacts, including secondary owners, key non-owners, and helpers, does not have a statistically significant effect on entrepreneurial expectancy or desired outcomes.
- Together, the above results suggest that quality is more important than quantity of network connections and that entrepreneurs do not necessarily need to network more, but need to network better and with individuals more equipped and aligned with their entrepreneurial goals.
- Within the social network lens, the hypothesized relationship between entrepreneurial expectancy, starting a business, and desired outcomes was positive and statistically significant.

Although understanding the effect of entrepreneurial social networks for the entire population of entrepreneurs is important, we sought to understand what differences exist along gender lines when evaluating causal relationships within the entrepreneurial expectancy framework and what effect those differences have on women entrepreneurs' expectations for their entrepreneurial endeavors. Critical gender differences included:

- The effect of primary owner social capital on entrepreneurial expectancy and desired outcomes is greater than that for men. However, secondary owner social capital is not a significant variable in our analysis, indicating that while primary owners may assemble business teams, they do not rely on the credentials and experience of their ownership team members when addressing their expectations and desires for the firm.
- The role of key non-owners in entrepreneurial social networking for female and male primary entrepreneurs differs. Key non-owner social capital positively affects entrepreneurial expectancy for women entrepreneurs, but not for male entrepreneurs.
- Helper social capital positively affects entrepreneurial expectancy and desired outcomes for both male and female entrepreneurs, similar to the overall population results discussed above.

Increasing awareness of the importance of entrepreneurial social networks and their effects on entrepreneurial expectations and desired outcomes will require action on a variety of fronts. Given the importance of social capital, including education, industry experience, startup experience, and work experience, to entrepreneurial social networks, policies and programs designed to bridge network gaps are necessary. Encouraging women to seek out key non-owners and helpers that align with their business goals and support their success is an avenue women entrepreneurs should explore to potentially improve the growth and success of their businesses.

In addition, it is important that women entrepreneurs catalog and understand their own social networks. This paper raises the critical issue of what services and assistance different network members bring to the entrepreneurial table and how those individuals and their experiences (social capital) influence the primary entrepreneur's expectations and desired outcomes for the business. An action item resulting from this research is for women entrepreneurs or aspiring entrepreneurs to inventory their networks. How many contacts germane to your entrepreneurial endeavor do you have? What skills and abilities do those individuals bring to your business? Perhaps most importantly, how can you effectively leverage those skills and contributions to increase the likelihood of continued business success? Key steps in this process include:

- **Classify** each component of your social network by function and skillset (i.e. which issues an individual may help to address)
- **Describe** the strength of each component of your network

- **Identify** gaps in your network in addressing entrepreneurial challenges, such as access to capital
- **Explore** secondary and tertiary relationships that may prove beneficial to fill identified gaps
- **Understand** the dichotomy between building a stronger network and effectively leveraging the network currently in place

Following a process to evaluate the strengths and weakness of a specific entrepreneur's network provides information at a select point in time. This can be advantageous for female entrepreneurs dealing with specific challenges that are present during a particular phase of the entrepreneurial effort. Nevertheless, an equally important consideration is that social networks are not static. Instead, social networks are dynamic and evolve over time. Furthermore, identification and qualification of critical network components should ideally be an ongoing process that provides the female entrepreneur the ability to react quickly to business challenges that might require leveraging different aspects of her social network.

Our findings, coupled with existing data and research, reinforce the fact that there are gender differences in social networking, particularly as it relates to nascent entrepreneurship. Women entrepreneurs should leverage targeted opportunities based on gender, but seek to round out their social networks by leveraging the strongest and most advantageous relationships, regardless of gender. This policy promotes avoidance of the women-only silo and associated stigma as well as promotes the concept of the entrepreneurial ally, whether female or male. This research points out that education surrounding these topics is important for women entrepreneurs, regardless of industry or entrepreneurial aspirations.

Another potential avenue for filling identified entrepreneurial social network gaps is promoting programs and organizations that offer mentorship.<sup>72</sup> This includes women's business centers, small business development centers, and local programs, such as accelerators. We explore the concept of a social network mentor that cuts across financial disciplines and is able to offer advice, guidance, and assistance to the entrepreneur when dealing with business-related challenges. Focusing on mentorship of female entrepreneurs will also aid in the critical step of assessing personal and network skills and identifying gaps. To that end, there are business assistive organizations that exist, including accelerators that are not women-exclusive. Highlighting these programs and marketing towards highly qualified and motivated women is in the best interest of the entire entrepreneurial community. In addition, encouraging individuals in powerful positions to actively seek out protégés is important to increasing the size and social capital of nascent entrepreneurs' social networks. Individuals that are more forthcoming of mentorship will enhance the next generation of both male and female entrepreneurs.

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<sup>72</sup> There is a variable in the PSED II that includes information on reasons for starting a business. Among many other options, respondents could select "mentor." However, the data were not sufficient to perform any statistically rigorous analyses.

While our findings provide insight into how social network intensity, including measures of both quality and quantity of network ties, affects entrepreneurial expectations and desired outcomes for nascent firms, there remain a number of areas for future research and policy considerations. These include:

- Analysis of changes in social network intensity and composition on a time-series basis throughout the entrepreneurial cycle. That is, are there gender differences at the outset of an entrepreneurial endeavor that dissipate as the firm grows? Conversely, do social network deficits negatively impact firm success? How do entrepreneurial social networks impact firm revenues and long-term survival?
- Future work would involve examining the extent to which female entrepreneurs adapt and change their social networks to increase the diversity in both strong and weak ties. For example, if a female entrepreneur starts with a social network composed entirely of women (e.g., a gender silo), to what extent, if any, does that entrepreneur's social network evolve over time to find entrepreneurial allies of the opposite sex?
- Extending the empirical findings of this research study to include a case study analysis of entrepreneurial outcomes and the role that social networks play for entrepreneurs is important research. Given that large scale surveys are both time and data intensive, there are relatively few sources of quality data that provide information on entrepreneurial dynamics by gender. Case studies that can extract critical information on the composition and use of social networks by different types of entrepreneurs (i.e., not only gender, but also industry, level of technology, etc.) will not only provide additional information but help supplement areas where data deficiencies exist.

Increasing women's awareness of the importance and impact of their entrepreneurial social networks is an important factor for economic growth, increasing entrepreneurial diversity, and fostering successful women-owned and women-led enterprises. Understanding the differences in men and women's social networks as well as the effects, negative and positive, of those differences is essential for nascent entrepreneurs and is a key policy concern as improved entrepreneurial social networks for women will benefit both women-owned businesses and foster greater economic growth overall.

## Appendix A – Glossary

- Entrepreneurial expectancy: the belief that a particular action will be followed by a particular outcome. In the context of entrepreneurship, entrepreneurial expectancy posits that an individual will take action in an entrepreneurial endeavor when they have positive expectations for business outcomes.
- Entrepreneurial social network: the collection of individuals on which an entrepreneur relies in developing and running a nascent firm.
- Expectancy theory: a dominant theoretical framework for explaining human motivation. The theory explains motivation based on three aspects of relationships and outcomes: expectancy, valence, and instrumentality.
- Helper: individual that does not own an equity stake in the business, but provides significant support, advice, or guidance to the owners on a regular basis.
- Key non-owner: individual that does not own an equity stake in the business, but made a distinctive contribution to founding the business.
- Men-owned business (MOB): business where the primary owner is a man.
- Primary owner: the individual identified in the PSED data as the leading owner of the business. This is the individual that responded to the survey.
- Secondary owner: individual identified in the PSED as an equity holder in the business that is not the primary owner.
- Social capital: the combination of industry experience, startup experience, education, and work experience an individual owns.
- Social network intensity: a combination of the number of individuals in an entrepreneur's network and the owner, key non-owner, and helper social capital.
- Solo entrepreneur: an entrepreneur that started their firm with no secondary owners, no key non-owners, and no helpers.
- Structural equation modeling (SEM): a general term used to describe a group of linked statistical models used in hypothesis testing.
- Women-owned business (WOB): business where the primary owner is a woman.

## **Appendix B – Technical**

The social capital variables used throughout this research report were constructed using the multi-stage, linear process outlined below. For primary owners, we did not take any averages since there is only one individual. For key non-owners and helpers, we did not include work experience because the PSED did not track work experience for these individuals.

### *Primary Owner*

We began by scaling the owner 1 education level, industry experience, startup experience, and work experience variables to achieve a maximum value of 5 for each category. We then summed the 5-point scaled variables for each primary owner, yielding owner 1 social capital.

PSED II variables used: AH6\_1, AH11\_1, AH12\_1, AH20\_1

### *Secondary Owners*

We began by separately summing the education level, industry experience, startup experience, and work experience variables for all secondary owners (owners 2 through 5). We then scaled the summed education and experience variables to achieve a maximum value of 5 for each category. We subsequently summed the 5-point scaled variables for the aggregate secondary owners, yielding secondary owner social capital.

PSED II variables used: AH6\_2, AH6\_3, AH6\_4, AH6\_5, AH11\_2, AH11\_3, AH11\_4, AH11\_5, AH12\_2, AH12\_3, AH12\_4, AH12\_5, AH20\_2, AH20\_3, AH20\_4, AH20\_5

### *Key Non-owners and Helpers*

We followed an identical process for defining the social capital of key non-owners and helpers. We began by summing the education level, industry experience, and startup experience separately. We then scaled the summed education and experience variables to achieve a maximum value of 5 for each category in a process identical to that used for owners. We subsequently summed the 5-point scaled variables, yielding the separate key non-owner and helper social capital variables.

PSED II variables used (key non-owners): AM7\_1, AM7\_2, AM7\_3, AM11\_1, AM11\_2, AM11\_3, AM12\_1, AM12\_2, AM12\_3

PSED II variables used (helpers): AN7\_1, AN7\_2, AN7\_3, AN11\_1, AN11\_2, AN11\_3, AN12\_1, AN12\_2, AN12\_3

### *Network Number*

We computed network number as the sum of the number of owners, number of helpers, and number of key non-owners. The minimum network number score of 1 applies to solo entrepreneurs.

PSED II variables used: AG2, AG13, AG18

### *Entrepreneurial Expectancy*

- AY6: Overall, my skills and abilities will help me start this new business.
- AY7: My past experience will be very valuable in starting this new business.
- AY8: I am confident I can put in the effort needed to start this new business.

### *Desired Outcomes*

- Increased status: the entrepreneur started the business to elevate their social status. The variables used include AW1 (to achieve a higher position in society), AW4 (to be respected by your friends), AW10 (to achieve something and get recognition for it), and AW14 (to have the power to greatly influence an organization).
- Increased autonomy: the entrepreneur started the business in order to increase their personal and/or professional autonomy. The variables used include AW2 (to have greater flexibility for your personal and family life) and AW5 (to have considerable freedom to adapt your own approach to work).
- Financial gain: the entrepreneur started the business to realize a financial gain. The variables used include AW6 (to give yourself, your spouse, and your children financial security), AW9 (to earn a larger personal income), and AW12 (to have a chance to build great wealth or a very high income).
- Personal goals: the entrepreneur started the business for personal and/or family reasons. The variables used include AW3 (to continue a family tradition), AW7 (to follow the example of a person you admire), and AW8 (to build a business your children can inherit).
- Realize vision: the entrepreneur started the business to realize a personal and/or professional vision. The variables used include AW11 (to develop an idea for a product) and AW13 (to fulfill a personal vision).