

# Expert capital and perceived legitimacy

## Female-run entrepreneurial venture signalling and performance

Patrick J. Murphy, Jill Kickul, Saulo D. Barbosa and Lindsay Titus

**Abstract:** *Research has shown that female entrepreneurs face unique barriers to entrepreneurial success, such as procuring funding and being perceived as credible. Limited past theory has addressed how these challenges can be met effectively by female-run entrepreneurial ventures. As a result, effective strategies for female entrepreneurs to overcome them are unclear. To address the need for research in this area, the authors use signalling theory to guide an empirical study utilizing panel study data based on 711 entrepreneurial ventures (334 female-run; 377 male-run). Signals perceived by outsiders pertaining to the risk preference, legitimacy and social capital of female-run ventures are examined and linked to venture funding, net worth and longevity outcomes. The results, based on non-parametric analyses and statistical modelling, suggest that expert capital (social capital from experts) leads to perceptions of higher legitimacy and funding success for female-run ventures.*

**Keywords:** *signalling theory; risk preference; legitimacy; social capital*

Patrick J. Murphy is with the Department of Management, Kellstadt Graduate School of Business, DePaul University, Chicago, IL, USA. Jill Kickul is with the Thomas C. Page Center for Entrepreneurship, Richard T. Farmer School of Business, Miami University, 218 Upham Hall, Oxford, OH 45056, USA. E-mail: kickuljr@muohio.edu. Saulo D. Barbosa is with the University of Grenoble II, Grenoble, France. Lindsay Titus is with the Simmons School of Management, Boston, MA, USA.

Female-run entrepreneurial ventures have generated value and fuelled innovation on community and global levels. In recent years, the increased presence of female-run entrepreneurial ventures has had a remarkable impact on employment and on business environments. For example, such firms now comprise approximately 25–33% of all businesses in the formal business economy worldwide and are reasoned to play an even larger role in informal socioeconomic and market systems (NFWBO, 2001). Research in this area has increased considerably as scholars and policy makers

have begun to devote greater attention to understanding and supporting female entrepreneurs (Gundry, Ben-Yoseph and Posig, 2002).

Examinations of entrepreneurship in gendered contexts have revealed barriers that constrain the establishment and growth of ventures run by females (Kourilsky and Walstad, 1998). Such barriers include access to credit and financial capital, technology and intellectual property, new customers, perceptions of legitimacy, and critical market or business information (Greve and Salaff, 2003). Although neither male nor

female entrepreneurs are able to communicate all relevant knowledge about their ventures to outsiders (Alvarez and Busenitz, 2001), females face unique challenges, particularly regarding perceived legitimacy (Finnegan, 2000). In contexts in which legitimacy is questionable, social capital (eg key relationships with other individuals) is a resource particularly valuable to entrepreneurs as it sends signals of credibility and potential value (Busenitz, Fiet and Moesel, 2005; Murphy, 2004).

Our aim in this paper is to examine the effects of a particular kind of social capital deriving from relations with experts or individuals with considerable experience that is highly relevant to the venture. We refer to this form of social capital as *expert capital*. We build on previous theory and develop hypotheses for the effects of expert capital on performance outcomes of funding success, net worth of venture, and longevity in female-run ventures. Our study draws from signalling theory (Busenitz *et al*, 2005; Deeds, Decarolis and Coombs, 1997) and is intended to shed light on the roles of expert capital and perceived legitimacy in female entrepreneurship contexts. This study represents the first large-scale research using signalling theory to explain the dynamics of female entrepreneurship contexts.

The features of gendered entrepreneurial contexts include female conformity to social norms, values and expectations, which can all be signalled to outsiders by female-run ventures (Aldrich and Fiol, 1994; Dowling and Pfeffer, 1975; Stuart, Hoang and Hybels, 1999). As such features appear to influence the viability and performance of entrepreneurial ventures (Riding and Swift, 1990), signalling theory is one framework for explaining that influence.

## **Signalling theory and female-run ventures**

Signalling theory in entrepreneurial contexts describes signs of the viability, competence and potential value of a venture as they are perceived by observers amidst uncertainty (Busenitz *et al*, 2005). The theory is based on the role of information signals (Deeds *et al*, 1997). In entrepreneurial contexts, the full set of information that is required to evaluate future venture success is never at hand. Thus, observers of a venture, which include investors, potential customers, partners and team members, utilize signals to navigate the asymmetry between what they know and what they need to know (Spence, 1974; Janney and Folta, 2003). Signals convey information about a venture to outsiders. If signalled information about a venture is unfavourable, it can increase equity costs, dissuade potential customers or halt funding processes (Busenitz *et al*, 2005). Signalling theory is concerned with the perceptions of

entrepreneurs and whether they are expected to succeed based on perceived legitimacy in social contexts (Greve and Salaff, 2003; Moran and Ghoshal, 1996; Nahapiet and Ghoshal, 1998). Experienced observers such as venture capitalists (VCs) assume that perceptions are frequently based on specious signalled information that is not actual. Thus, it is important for ventures to signal value to outsiders as they become increasingly viable (Prasad, Bruton and Vozikis, 2000, p 168). With positive information signals, observers can arrive at favourable perceptions similar to those based on due diligence with reduced time and effort (Harvey and Lusch, 1995).

Previous research on female-run ventures delineates a process emergence, growth and eventual viability. This research has shown that, from a gendered perspective, the entrepreneurial process includes particularly complex arrays of motivators, propensities and intentions. For example, research has shown strategy formulations of female-run ventures to be particularly complex because female entrepreneurs recognize unique circumstances around information seeking and planning (Gundry and Welsch, 2001). However, as there is a paucity of theory to explain those circumstances, empirical examinations that focus solely on female-run ventures are limited and the body of research is stratified. Existing work does not draw from a base that is commonly amenable to gendered contexts. In what follows, we review concepts of risk preference, perceived legitimacy and social capital and explain the roles of those factors based on signalling theory. Finally, we develop hypotheses to guide empirical examination of a sample of female-run ventures.

### *Preference for risk*

Individual risk preference consists of a general desire to pursue or avoid situations when the eventual outcome is unknown and cannot be inferred (Sitkin and Pablo, 1992). It is a direct determinant of risk propensity, which is the expressed tendency to prefer risk in particular decision contexts. When faced with different situations, individuals exhibit different behaviours in response to risk. Also, different individuals in the same situation can and do exhibit different risk preferences (Mullins and Forlani, 2005; Sitkin and Pablo, 1992). Risk preferences correspond to a kind of disposition, which, if combined with contextual factors, can forecast attitudes about risk in context. In this paper, we use the terms 'risk preference' in relation to our empirical measure and 'risk propensity' as it is used more commonly in the literature. Past research has hypothesized that entrepreneurs have higher risk propensities than non-entrepreneurs, but the results of those studies have been indeterminate (Brockhaus,

1980; Busenitz, 1999; Palich and Bagby, 1995). Instead, research indicates that context plays an important role in risk-taking behaviour (Delmar, 1996; Hogarth, 1987; March and Shapira, 1987).

When it comes to risk propensities in gendered contexts, research findings are mixed. Early research on risk taking indicated that women were more risk-averse than men in organizational and business situations (Pettigrew, 1958). Whereas that early research reflected general notions, recent research provides evidence that women are not more risk-averse than men in specific situations, such as when making financing decisions (Schubert, Brown, Gysler and Brachinger, 1999). Other recent research offers evidence that women are less likely to turn to banks for financing due to risk aversion and also less likely to assume debt (Chaganti, 1986; Collerett and Aubry, 1990). Still other research reports no difference between the risk-taking propensities of men and women in business and entrepreneurial situations (Masters and Meier, 1988). Although the relationship between gender and risk is unclear, risky decisions are certainly germane to entrepreneurial activity. As indicated by the prevalence of research supported by the Office of Advocacy, the role of gender in entrepreneurial contexts continues to inspire research on female-run entrepreneurial ventures (Small Business Administration, 2005).

One stream of research suggests that risk preference may differ in females not because of innate characteristics, but because of female perceptions of their circumstances in entrepreneurial contexts. As mentioned, female entrepreneurs do appear to face less favourable business conditions, such as higher interest rates and stricter co-signatory requirements for loans. As such, there is evidence that those external conditions compel women rationally to seek equity financing instead of debt financing, which may be misinterpreted as an internal tendency to avoid risk (Chaganti, DeCarolis and Deeds, 1995). By showing that women pursue low-risk financial strategies because of unique obstacles, this work qualifies person-centric entrepreneurship research targeting gender.

Taking a signalling theory perspective in research on female-run ventures can help mitigate the trade-off between internal and external locus of risk preference. The approach holds that female entrepreneurs, when reflecting comfort with risk, send signals to observers that they are able to make sound entrepreneurship and management decisions in high-risk venture contexts. In circumstances where possible outcomes include a positive funding decision from an investor, whether preference comes from person-centric traits or calculated decisions is less important than the investor's

perception of the relevant signals. Simply put, to the degree that observers perceive risk preference as important to the viability of a venture, they are more likely to see that venture as potentially viable.

Risk preference can influence the perceived legitimacy of female entrepreneurs to the extent that it fosters confidence and self-efficacy. Krueger and Dickson (1994), for example, show an increase in perceived self-efficacy to be associated with higher risk taking by affecting perceptions of external opportunities and threats. Positive self-efficacy beliefs may also signal to potential investors and other observers that a female entrepreneur is capable of doing what she claims she and her venture will do.

#### *Perceived legitimacy*

Being perceived as a legitimate business person with credibility can serve as a resource for promoting a venture's viability, especially during early and growth stages (Suchman, 1995). Information signals indicating credibility and legitimacy are instrumental in procuring resources (Busenitz *et al*, 2005). They can herald relevant industry experience, relationships with key industry players, access to information, and possession of expert knowledge. Male and female entrepreneurs have varying disadvantages in terms of these dimensions. There is evidence that female entrepreneurs are more highly conscious of threats to legitimacy (Kourilsky and Walstad, 1998). As a result, their intentions to establish entrepreneurial ventures can seem less strong than those of their male counterparts. Beliefs about one's abilities have also been shown to affect entrepreneurial intentions, opportunity perceptions and risk taking (Boyd and Vozikis, 1994; Krueger and Dickson, 1994; Wilson *et al*, 2004). The perceived legitimacy of female entrepreneurs is liable to affect their sense of disadvantage and drive lower self-efficacy, thus sending information signals indicating lower levels of confidence in their venture.

The legitimacy of a female entrepreneur signalled to outside observers is tied to the values and other aspects of the context in which she is functioning. Where females have not occupied entrepreneurial roles as frequently as males, signals of legitimacy are difficult to convey to outsiders (Eagly, 2005). An inability to convey signals that one is legitimate is not related to whether one is aware of external barriers or less confident or capable. Thus, from a signalling theory perspective, environmental logic determines, to a large degree, whether female-run entrepreneurial ventures are perceived as legitimate. Perceived legitimacy thus does not derive solely from person-centric factors, but from the overall set of values shared by members in a social system.

### Social capital

Social capital refers to connections with other individuals who provide access to various kinds of resources. It includes structural, relational and cognitive dimensions. The structural dimension includes interaction processes with other individuals and is germane to perceptions of legitimacy (Nahapiet and Ghoshal, 1998). In this dimension, the location of an entrepreneur in a social network provides various advantages by virtue of their level of access to the various areas of the social system in which they are embedded (Granovetter, 1983). Some entrepreneurs, for example, are able to use informal personal friends and potential customers in addition to consultants and venture capitalists to obtain valuable information or to access information and financial support. Other entrepreneurs with fewer social ties are not able to procure such resources (Witt, 2004). The value of social capital, once procured, has been shown to be relatively equal for male and female entrepreneurs in a variety of industry sectors. The number of contacts appears to be less important to venture viability than having the right contacts, such as industry experts (Liao and Welsch, 2005).

Social capital research pertaining to the viability of female-run ventures offers indeterminate results. Some studies find no relationship between female entrepreneurial success and social capital (Carsrud, Gaglio and Olm, 1987). Others target specific social activities through phases of venture development in network contexts. For example, Greve and Salaff (2003) reported that female entrepreneurs used different kinds of social capital across entrepreneurial stages. Although informal contacts were found to be instrumental in all phases, women generally used such contacts much more than men, including even those men who had inherited their business. Other research has found reliable relationships for all types of entrepreneurs between information signals and innovation activity in social networks (Julien, Andriambelason and Ramangalahy, 2004).

A signalling theory perspective on social capital can help address some of the gaps conceptually. The content of information signals to observers varies in terms of richness and relevance (Busenitz *et al*, 2005) and there is evidence that certain kinds of social contacts are more valuable than others to venture viability. As such, female-run ventures may send stronger and more positive information signals when they are socially linked with industry experts and high-credibility others. Research has shown that ventures that receive advice from business advisers and industry experts incur higher growth and performance (Berry, Sweeting and Goto, 2006). As explained, signalling theory posits in

such circumstances that information signals to outside parties are important for the perceived legitimacy of the entrepreneurial venture. Thus, observers external to a venture may receive stronger information signals to allay information asymmetry, including the perceived legitimacy of a female entrepreneur, when experts help make up the social capital of the venture.

Our review of risk preference, perceived legitimacy and social capital in female-run venture contexts utilized a signalling theory foundation. In what follows, we build on that foundation and develop hypotheses for how the key variables relate to entrepreneurial outcomes and describe an examination of expected effects.

### Development of hypotheses

A signalling theory approach pertains to how observers perceive and judge female-run entrepreneurial ventures. Investors, alliance partners and other observers evaluate signals reflecting venture characteristics (eg founder management style, expertise, legitimacy) instead of those characteristics themselves because it saves time and resources (Busenitz *et al*, 2005). For entrepreneurs, therefore, information signals sent to potential investors and customers can lead to varying levels of eventual venture funding, net worth and longevity. For female entrepreneurs in particular, who experience unique circumstances and are perceived differently from male entrepreneurs, signalling theory is especially applicable. In what follows, we present an empirical study integrating those notions. The undertaking examined relationships between antecedents of risk preference, perceived legitimacy and social capital with female-run venture outcomes of venture funding, net worth and longevity.

Past research has long cast decision making in risky circumstances as part of entrepreneurship (Knight, 1935). From the standpoint of observers, inferences about the actual risk preference of an entrepreneur based on signals are important. For female entrepreneurs, who have been posited as more risk-averse than male entrepreneurs, perceptions of risk based on information signals are particularly salient. Thus, to establish first the role of risk preference in female-run venture performance, we hypothesize that risk preference leads to venture outcomes of formal funding success, net worth and longevity:

*Hypothesis 1<sub>a</sub>: Female entrepreneurs preferring high risk procure venture funding.*

*Hypothesis 1<sub>b</sub>: Female entrepreneurs preferring high risk realize high net worth ventures.*

*Hypothesis 1<sub>c</sub>: Female entrepreneurs preferring high risk incur greater venture longevity.*

The perceived legitimacy of female-run ventures affects their viability and success because outsiders such as potential investors and customers are critical resources. Such outside individuals will not invest in or patronize a venture that they do not perceive as legitimate. Thus, when a female-run entrepreneurial venture is not perceived as legitimate, it is less likely to procure formal funding and therefore more likely to absorb high start-up costs that hinder net worth and fail sooner. We thus hypothesize that perceptions of legitimacy by individuals external to the venture lead to outcomes of formal funding success, net worth and longevity:

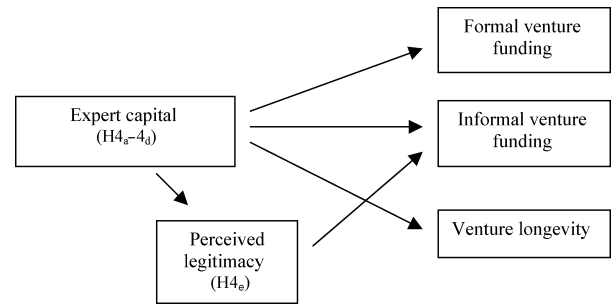
- Hypothesis 2<sub>a</sub>*: Female entrepreneurs perceived as legitimate procure venture funding.  
*Hypothesis 2<sub>b</sub>*: Female entrepreneurs perceived as legitimate realize high net worth ventures.  
*Hypothesis 2<sub>c</sub>*: Female entrepreneurs perceived as legitimate incur greater venture longevity.

Social capital is important to the success of female-run entrepreneurial ventures because it provides access to information and advantages that allow entrepreneurs to take options otherwise not available to them. The benefits of social capital can include funding and entrepreneurial venture performance outcomes. In the case of female-run ventures, social capital can serve to mitigate some of the unique circumstances facing entrepreneurs regarding their perceived legitimacy. Therefore, we hypothesize that perceived legitimacy leads to female-run venture outcomes of formal venture funding success, net worth and longevity:

- Hypothesis 3<sub>a</sub>*: Female entrepreneurs with high social capital procure venture funding.  
*Hypothesis 3<sub>b</sub>*: Female entrepreneurs with high social capital realize high net worth ventures.  
*Hypothesis 3<sub>c</sub>*: Female entrepreneurs with high social capital incur greater venture longevity.

Recent work suggests that a lack of social capital from experts can also reduce the credibility signals emitted by entrepreneurs (Berry *et al*, 2006; Busenitz *et al*, 2005). Particularly in gendered contexts, female entrepreneurs are sensitive to being perceived as not having legitimacy (Kourilsky and Walstad, 1998). We thus reason that aspects of the relational dimension of social capital pertaining to expert content (Nahapiet and Ghoshal, 1998) are especially effective for enabling female-run ventures to send out the strong information signals instrumental to valued outcomes.

Female entrepreneurs have been found to rely on informal contacts more frequently than male entrepreneurs (Greve and Salaff, 2003). Female-run entrepreneurial ventures are also known to face less favourable venture funding circumstances (Riding and



**Figure 1.** Expert capital and perceived legitimacy: hypothesized relationships with outcomes.

Swift, 1990). Studies of social networks show that relationships with experts can be informal (eg mentors) as well as formal (eg paid consultants) in social contexts (Granovetter, 1983). On these grounds, we parsed venture funding into informal (eg friends, family) *versus* formal (eg banks, venture capitalists) types to examine both kinds of linkages. This rationale leads directly to a model encompassing a set of five hypotheses (Figure 1):

- Hypothesis 4<sub>a</sub>*: Female entrepreneurs with expert capital procure greater formal funding.  
*Hypothesis 4<sub>b</sub>*: Female entrepreneurs with expert capital procure greater informal funding.  
*Hypothesis 4<sub>c</sub>*: Female entrepreneurs with expert capital incur greater venture longevity.  
*Hypothesis 4<sub>d</sub>*: Female entrepreneurs with expert capital are perceived as more legitimate.  
*Hypothesis 4<sub>e</sub>*: Female entrepreneurs perceived as legitimate procure greater informal funding.

## Method and procedure

The Panel Study of Entrepreneurial Dynamics (PSED: [www.projects.isr.umich.edu/psed](http://www.projects.isr.umich.edu/psed)) involved over 100 entrepreneurship scholars and researchers (Reynolds, 2000). The PSED built on earlier research at the University of Michigan Institute for Social Research (Curtin, 1982; Reynolds and White, 1993) examining the entrepreneurship process with a view to comprehensive description and explanation (Shaver *et al*, 2001).

Compilation of the PSED dataset began with a random telephone survey of 64,622 adults in the USA. Cases had to meet three criteria to qualify for inclusion: (1) the individual had to expect to own all or part of the venture, (2) start-up activity (eg renting space, hiring employees) must have occurred during the past 12 months, and (3) the venture could not have generated income to cover operating expenses for more than three months.

### Sample

Data were provided by various individuals associated with entrepreneurial ventures across time (Reynolds and Curtin, 2004, p 468). The usable PSED sample consisted of 1,261 cases and included a mail survey (Shaver *et al*, 2001) that provided primary data for this research. Of the 711 cases who reported starting a new business venture (NBV) on their own, 334 (47%) indicated female and 377 (53%) indicated male as their gender. We targeted these cases and coded them for gender.

Study variables were operationalized by PSED survey items. The independent variables (IVs) included risk preference, legitimacy and social capital. The dependent variables (DVs, outcomes) included venture funding, net worth and longevity. The wordings of the items and response options appear in the section reporting study results.

*Nature of study data.* The PSED data feature turbulent variation patterns that necessitate careful consideration when conducting empirical examinations. Ignoring these considerations will lead to violations of common analysis assumptions and specious findings in empirical work (Murphy, 2004). For instance, of 132 valid responses for venture net worth, 29 of these (27.4%) were \$0, the lowest value on the scale. The remaining variable scores were distributed erratically and included values greater than 10 standard deviations above the mean, yielding an extremely skewed and kurtotic distribution. Whereas a skewness statistic value more than twice its standard error (SE) indicates a departure from normality (SPSS, 2002), the skewness statistic for the venture net worth scores was 6.56 (SE = 0.235), a 27.9 multiplier difference and evidence of extreme skewness.

Assuming random selection, the central limit theorem holds that samples of sufficient size ( $n > 30$ ) tend to approximate normal frequency distributions regardless of the population distribution (Winer, Brown and Michels, 1991, p 21). The normal distribution is vital to parametric statistics based on least squared estimates such as multiple regression and analysis of variance (Hays, 1994, p 244). Departures from normality and outliers jeopardize the conclusion validity of such tests (Tabachnik and Fidell, 1996, pp 327–330). We responded to violations of normality via dichotomous recoding (using median splits) in light of statistical analysis requirements. Most study variables lent themselves directly to dichotomization. For example, the item for risk preference queried directly which of two more or less risky NBV options was preferable to the entrepreneur.

### Statistical analyses

Our study data required a statistical method robust to violations of normality. The issue is important because such violations have been cited as especially relevant to entrepreneurship research due to the volatile nature of entrepreneurship data (Robinson and Hofer, 1997). Distribution free (ie non-parametric) statistics offer a method to avoid violations of parametric analysis assumptions (Murphy and Shrader, 2004; Robinson, 1996). As a flexible analysis technique (Siegel and Castellan, 1988, p 3), non-parametric methods do not rely on reference to a functional form such as population-derived univariate or multivariate normal distributions of scores. Instead, they utilize sample-specific multinomial distributions to forecast membership in theoretically derived categories. The assumptions of non-parametric methods are general and satisfied in most settings, whereas violations of parametric analysis assumptions are common and bear directly on the validity of research results (Hardle, 1994, p 4).

One way to avoid violations of analysis assumptions is to execute logarithmic transformations of variables in attempts to yield the normalized score distributions that allow parametric tests. For the PSED data used in our study, however, the amount of missing data frustrated such attempts. Thus, the greater capacity of a non-parametric approach to handle such missing data (Hardle, 1994, p 13) warranted our decision to safeguard conclusion validity by dichotomizing variables and conducting non-parametric frequency analyses employing  $X^2$  test statistics.

A non-parametric approach does not require the use of weightings to correct for sample differences from the population (Curtin and Reynolds, 2004, pp 492–493). As explained above, unlike the logic of parametric approaches, the logic of non-parametric approaches does not statistically relate sample data to population data based on the nature of the sample distribution. Whereas sample weightings are thus required logically for parametric analysis approaches, there is no logical or mathematical reason for sample-specific non-parametric analyses to employ weights for results better to reflect the population from which the sample data were drawn.

## Results

We report study results in two stages corresponding to hypotheses 1–3 and hypotheses 4<sub>a</sub>–4<sub>c</sub>. The first stage examined variables with male and female comparisons. The second stage integrated expert capital as a variable. Table 1 presents verbiage from the items and response options, recodings and frequency counts for all variables used in both stages.

**Table 1. Recoded study variables included in analyses ( $n = 711$ ).**

	Response option	Count	Percentage
Gender	Female	334	47.0
	Male	377	53.0
	Total	711	
Risk preference	Little risk of failure and little likelihood of making you a millionaire	407	82.4
	More likely to make you a millionaire but much higher chance of going bankrupt	87	17.6
	Total	494	
Legitimacy	Taken seriously as a business person	170	44.9
	Not taken seriously as a business person	203	55.1
	Total	373	
Social capital	Opportunity related to relationships with other people	288	68.1
	Opportunity not related to relationships with others	135	31.9
	Total	423	
Expert social capital	Absence of expert mentors was not a problem	161	44.0
	Absence of expert mentors was a problem	205	56.0
	Total	366	
Venture funding	High informal funding success (spouse, partner, friends, family – including employees' spouses, partners, friends, family)	50	46.3
	Low informal funding success (spouse, partner, friends, family – including employees' spouses, partners, friends, family)	58	53.7
	Total	108	
	High formal funding success (employer, bank, venture capitalist)	164	70.7
	Low formal funding success (employer, bank, venture capitalist)	68	29.3
	Total	232	
Venture net worth	Upper half (>\$10,000)	56	42.4
	Lower half (<\$10,000)	76	57.6
	Total	132	
Venture longevity	Active (one year later)	274	62.6
	Inactive (one year later)	164	37.4
	Total	438	

### Tests of analysis assumptions

The frequency analyses required cell frequencies to be independent. Examination of Table 1 suggested that no case contributed values to multiple cells in our design and no count totals exceeded valid sample size. For the purposes of statistical power, our analyses required a multiplier difference of five between sample size and the number of cells (Tabachnik and Fidell, 1996, p 243). Also, expected cell frequencies based on two-way associations had to exceed five (Milligan, 1980). Due to a small total number of variable levels ( $k = 16$ ) combined with sample size ( $n = 711$ ; 334; 377), none of the  $X^2$  tests violated these assumptions. These observations supported frequency analyses using  $X^2$  test statistics as an acceptable analysis method.

### Tests of effects

We first executed three analysis runs (overall, female, male). For all cases ( $X^2 = 3.61$ ;  $p = 0.039$ ) and for men entrepreneurs only ( $X^2 = 2.78$ ;  $p = 0.069$ ), high

perceived legitimacy related positively to venture longevity. Perceived legitimacy had no relation ( $X^2 = 0.804$ ;  $p = 0.246$ ) to venture longevity for female entrepreneurs and all other tests were non-significant. Thus, we found support only for hypothesis 3<sub>c</sub> in the case of male entrepreneurs. Table 2 presents results for all three analysis runs in study stage one.

Next, we executed three parallel analysis runs to assess the relationships illustrated in Figure 1. For female entrepreneurs only, high expert capital was found to relate positively ( $X^2 = 3.43$ ;  $p = 0.061$ ) to formal venture funding. High expert capital was also found to relate positively to perceived legitimacy for all entrepreneurs in general ( $X^2 = 8.84$ ;  $p = 0.003$ ) and for women ( $X^2 = 6.63$ ;  $p = 0.008$ ) as well as men ( $X^2 = 3.10$ ;  $p = 0.057$ ) in particular. High perceived legitimacy, in turn, related positively ( $X^2 = 3.81$ ;  $p = 0.070$ ) to informal venture funding for women only. Thus, we found support for hypotheses 4<sub>a</sub>, 4<sub>d</sub> and 4<sub>c</sub>. Table 3 presents the results of study stage two for all three analysis runs.

**Table 2. Hypothesis tests<sup>1</sup> for overall (n = 711), female (n = 334) and male (n = 377) entrepreneurs.**

	Hypothesis	Overall			Female			Male			
		Valid n	X <sup>2</sup>	p	Valid n	X <sup>2</sup>	p	Valid n	X <sup>2</sup>	p	
Risk preference											
	Formal venture funding	1 <sub>a</sub>	159	0.011	0.570	68	0.020	0.630	91	0.000	0.637
	Venture net worth	1 <sub>b</sub>	114	0.067	0.491	59	0.203	0.451	55	0.138	0.532
	Venture longevity	1 <sub>c</sub>	345	0.033	0.483	158	0.001	0.585	187	0.066	0.472
Perceived legitimacy											
	Formal venture funding	2 <sub>a</sub>	101	0.401	0.339	45	0.616	0.318	56	0.000	0.620
	Venture net worth	2 <sub>b</sub>	75	0.191	0.420	40	0.100	0.500	35	0.276	0.440
	Venture longevity	2 <sub>c</sub>	<b>231</b>	<b>3.605</b>	<b>0.039</b>	107	0.804	0.246	<b>124</b>	<b>2.782</b>	<b>0.069</b>
Social capital											
	Formal venture funding	3 <sub>a</sub>	140	0.199	0.405	59	0.045	0.556	81	0.633	0.305
	Venture net worth	3 <sub>b</sub>	97	0.099	0.548	49	0.183	0.451	48	0.879	0.295
	Venture longevity	3 <sub>c</sub>	296	0.689	0.241	137	0.001	0.571	159	1.214	0.176

<sup>1</sup>Significant one-tailed effects ( $p < 0.10$ ) appear in bold.

**Table 3. Hypothesis tests<sup>1</sup> for overall (n = 711), female (n = 334) and male (n = 377) entrepreneurs.**

	Hypothesis	Overall			Female			Male			
		Valid n	X <sup>2</sup>	p	Valid n	X <sup>2</sup>	p	Valid n	X <sup>2</sup>	p	
Expert capital											
	Formal venture funding	4 <sub>a</sub>	107	0.093	0.432	<b>47</b>	<b>3.426</b>	<b>0.061</b>	60	1.482	0.178
	Informal venture funding	4 <sub>b</sub>	49	0.299	0.401	18	0.012	0.648	31	0.797	0.306
	Venture longevity	4 <sub>c</sub>	259	0.225	0.366	119	1.843	0.122	140	0.352	0.337
	Perceived legitimacy	4 <sub>d</sub>	<b>243</b>	<b>8.842</b>	<b>0.003</b>	<b>116</b>	<b>6.629</b>	<b>0.008</b>	<b>127</b>	<b>3.101</b>	<b>0.057</b>
Perceived legitimacy											
	Informal venture funding	4 <sub>e</sub>	53	1.128	0.220	<b>20</b>	<b>3.810</b>	<b>0.070</b>	33	0.017	0.590

<sup>1</sup>Significant one-tailed effects ( $p < 0.10$ ) appear in bold.

*Statistical modelling.* We examined the model fit of Figure 1 with sample data to provide further evidence for the validity of study findings. A non-significant test statistic ( $X^2 = 10.07$ ;  $df = 5$ ;  $p = 0.073$ ) indicated that departure from sample data was not significant. Drawing from research on model fit (Wheaton *et al.*, 1977), we calculated  $X^2/df$  as a discrepancy index and found the ratio of 2.01, indicating that the model reflected sample data well (Byrne, 1989, p 55; Carmines and McIver, 1981, p 80). Finally, an RMSEA statistic of 0.038 indicated close fit of the model to the data in relation to its degrees of freedom (Browne and Cudek, 1993).

## Discussion

We examined multiple antecedents and outcomes for the purpose of generating theory-driven empirical findings that illustrated the specific context of female-run entrepreneurial ventures. By incorporating a relevant conceptual framework, our findings hold heuristic value for explaining a complex set of variable interrelationships. In what follows, we discuss our findings in conjunction with past work, giving special attention to

what female entrepreneurs can do to procure resources, send signals of legitimacy to the business community, and achieve entrepreneurial success.

### *The role of expert capital*

Social capital for female-run entrepreneurial ventures frequently comes in the form of social contacts that facilitate resource procurement (Nahapiet and Ghoshal, 1998). Female entrepreneurs who rely on expert capital are perceived as more legitimate. Thus, expert capital procures an intangible resource that can be *essential* to NBV outcomes. Intangible resources can include information for entrepreneurs to recognize opportunities (Hills, Lumpkin and Singh, 1997), support for decision making (Bruderl and Preisendorfer, 1998) and, as found by our study, perceived legitimacy (Deeds *et al.*, 1997). Hence our study shows that it is critical for women to utilize such contacts, thus contrasting with research describing such contacts as having little effect on outcomes (Carsrud *et al.*, 1987).

Expert capital promotes perceived legitimacy because it brings the intelligence, education and reputation of experienced professionals to bear on critical issues



facing an entrepreneurial venture. We argue that procuring expert capital is particularly important to the legitimacy of female entrepreneurs. Our findings suggest that the presence of expert capital sends signals that female and male entrepreneurs are equally serious contributors to the business community. Expert capital relationships can be seen as ‘conduits’ through which female-run ventures signal to the business community that they are reputable and legitimate, as well as procuring additional social capital.

Our study replicates research showing that expert capital provides access to tangible resources and helps explain financing patterns of female-run ventures. We offer evidence that female entrepreneurs with expert capital are more likely to procure funding through formal channels such as banks or venture capitalists. Interestingly, current work in the area shows that fast-growing female-run ventures are significantly more likely (32% versus 21%) than their male-run counterparts to rely on informal sources such as credit cards for funding (NFWBO, 2001). Also, they are less likely to receive commercial bank loans than their male-run counterparts (39% versus 52%). Quoting Teri Cavanagh, primary underwriter of the NFWBO and Director of the Women Entrepreneurs Connection at FleetBoston Financial (now Bank of America):

‘This reliance on personal debt is holding women business owners back. This study clearly indicates that women who understand how to leverage debt and equity have a far greater chance of becoming owners of fast-growing – or gazelle – businesses.’

To this point, our findings suggest that procuring expert capital is an effective way for female entrepreneurs to gain understanding of how to leverage debt and equity. Such procurement is important for sending signals of legitimacy in business communities.

The likelihood of entrepreneurial success can be increased by the nature and structure of an entrepreneurial network. Structural holes, for example, are amenable to opportunity identification as they are easier to manipulate when seeking resources. Because venture funding appears to be associated with expert capital, our study offers at least one way for female entrepreneurs to seek venture funding.

#### *The role of legitimacy*

Our results for model fit revealed that legitimacy could function as an antecedent of informal venture funding for female entrepreneurs. Drawing from Burt (1982), informal contacts such as family or friends are more likely to relate positively to entrepreneurs. However, our results show that informal contacts may be especially likely to support female entrepreneurs when they are

perceived as credible. Thus, signs of legitimacy may build confidence in informal contacts and sway them to invest in the venture independently of the informal relationship. Whereas family and friends are in fact personal relations who know the entrepreneur well, our study shows that signals of legitimacy are still important. This clear evidence of the ‘extra hurdle’ women entrepreneurs need to clear when seeking funding goes beyond the informal relationship (Brush *et al.*, 2004). Although informal contacts can offer support, it seems that women entrepreneurs still face the potential obstacle of establishing legitimacy in the eyes of informal contacts when it comes to procuring funding.

Like past research, ours did not find clear results for the impact of risk preference on entrepreneurial outcomes. We believe that risk is a relative concept and is tied to idiosyncratic circumstances of individual entrepreneurs. As Chaganti *et al.* (1995) show, an entrepreneur incurs risk for internal and external reasons. In light of such variation, our results may not indicate relationships involving risk preference because the survey item did not capture the variable fully. Theory-driven research on risk in female entrepreneurship contexts perhaps stands to make significant discoveries in this area using qualitative research.

Another aspect of our findings for risk preference is consistent with the past work on risk taking, showing evidence of context dependence (Hogarth, 1987; March and Shapira, 1987; Mullins and Forlani, 2005; Slovic, Fischhoff and Lichtenstein, 1982). This work explains entrepreneurial behaviour in terms of risk perception (not risk propensity) and cognitive heuristics and biases (Busenitz and Barney, 1997; Busenitz, 1999; Keh, Foo and Lim, 2002; Palich and Bagby, 1995; Simon, Houghton and Aquino, 2000). Risk is inherently subjective by virtue of its cognitive processes and social comparisons. As PSED data do not capture such cognitive and social dimensions of risk, it is likely that our results do not show clear evidence of an effect on entrepreneurial outcomes. Another explanation, particularly concerning the role of legitimacy and risk preference on entrepreneurial outcomes, stems from the ‘illusion’ of greater risk taking that attaches itself to entrepreneurs (Janney and Dess, 2006). This kind of perceptual bias is acute when an entrepreneur’s specialized knowledge is difficult to observe. Thus, knowledge asymmetry shifts risk perceptions and can diminish the role of person-centric variables such as risk preference. Specialized knowledge is essential to entrepreneurial discovery and opportunity recognition (Murphy, Liao and Welsch, 2006; Shane and Venkataraman, 2000). However, the related information asymmetry can generate differences in risk perceptions

and can also affect the perceived legitimacy of the entrepreneur. Signals given by entrepreneurs in these contexts can contribute to reducing information asymmetry, building legitimacy and qualifying perceptions related to risk. Our findings in this area build on Aldrich and Fiol (1994) who explored information asymmetry and legitimacy in emerging industries. Specifically, our findings suggest that the same issues are faced by female entrepreneurs, who may have to share greater information than male entrepreneurs to build legitimacy or procure venture funding.

#### *Study limitations*

Our empirical methods warrant a minor degree of care when interpreting study findings for practical application. First, by using a non-parametric analysis approach robust to data turbulence (Robinson and Hofer, 1997), our analyses are expected to have high validity. However, non-parametric analyses do not rely on reference to ideal functional forms, as they are based on multinomial sample-specific distributions instead of population-derived univariate or multivariate normal distributions. Due to the rigour of the PSED data collection process (Reynolds, 2000), we believe the integrity of the sample data is intact and generalizations based on our findings are reasonable. Second, as we drew all data from the same large sample, there is a risk of single-source bias confounding our results. We believe this limitation is also mitigated as the data collection was not a one-shot procedure and longitudinal. For example, venture longevity was a longitudinal outcome variable collected one year after the first wave (Shaver *et al.*, 2001).

#### *Future direction*

Forthcoming research can build on our study by focusing on differential roles of expert capital *versus* general social capital in the context of gendered entrepreneurship. Given our findings, future research could investigate how general social capital is instrumental to developing networks of expert capital (or vice versa). One forum offering such potential is the 'Promotion of Women Entrepreneurs' (ProWomEn) launched by the European Commission. ProWomEn includes contributions of representatives from 20 regions in European Union member countries. Collaborators share policies and actions to support women in entrepreneurship. Such projects also promise to foster networks of expert capital and social capital for female entrepreneurs.

Female entrepreneurs can use various techniques to establish networks. For example, they may seek out other women more often than men for information,

assistance, encouragement or moral support (Smeltzer and Fann, 1989). Ironically, most of these kinds of resources derive from occupations dominated by males, such as banking, accounting and legal services. The results of our study regarding expert capital, therefore, beg the additional question of whether this important form of capital comes more frequently from male or female experts.

Our study suggests that female entrepreneurs rely more than men on informal contacts. Tigges and Green (1994) also found that male business owners were more likely to utilize lawyers and CPAs for support, whereas women relied more on family and friends. As female entrepreneurs seek financial support, other kinds of concurrent support provided by informal contacts may remain important to them. Given our findings for legitimacy and informal funding, future research thus has an opportunity to clarify the role of legitimacy in seeking social support.

Finally, our results hold implications for public policy initiatives, such as entrepreneurial assistance programmes supporting the development of social capital networks for female entrepreneurs. Programmes such as ProWomEn or those offered by the Small Business Association are designed for start-up ventures like the ones targeted in our study. The results of our study offer information pertinent to supporting the overall mission of programmes that assist female entrepreneurs.

## **Conclusion**

Our undertaking is the first large-scale field study of female-run entrepreneurial ventures. Our results provide evidence useful for examining the unique circumstances of female entrepreneurs. We analysed data carefully with a view towards the process of leveraging, developing and growing resources for female-run ventures. Our findings point to the kinds of steps aspiring or actual female entrepreneurs can take to chase entrepreneurial success more effectively. Such steps especially include procuring expert capital as a means of signalling legitimacy and achieving funding success. The implications offer understanding of gender in modern economic systems, in which recognizing market opportunities, surviving periods of upheaval and enhancing venture growth and sustainability on a level playing field are essential for all entrepreneurs.

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