Women in Leadership:
The Relationship Between Gender and Venture Capital Investments and the Mediating Effects of Risk Perceptions

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Abstract

Previous research on gender stereotypes within the workforce has shown that women are often treated differently than their male counterparts and co-workers. This becomes evident in the fact that women will often be confronted with a glass ceiling effect, disadvantaging them in their pursuit of corporate leadership positions and status. Past studies have also begun to examine this effect and the associated disadvantages within an entrepreneurial setting. Women are considered to be a minority within entrepreneurial settings and have been said to lack risk taking and risk management propensities. This, along with other, preconceptions have made it harder for women to attain similar status, power, and funding, than male entrepreneurs. Especially a lack in funding for women-owned businesses can have immense implications for economic growth and success. Therefore, the aim of the present study was to examine to what extent gender and gender-based risk perceptions influence venture capitalist's willingness to invest into a start-up. It was hypothesised that women would receive lower funding than their male counterparts, and that investment decisions would be mediated by the level of perceived risk. To examine this, an online experiment was conducted, in which participants were asked to assess a potential start-up investment opportunity and assign funding. The allocated investment portfolios presented a manipulation of the independent variable, gender. Subsequently venture capital funding amounts and the perceived risk of the start-up investment were measured. As expected, women received significantly lower funding than men. Furthermore, this study revealed that risk perceptions had a substantial effect on how investors allocated their venture capital funds. The results showed that female-founded start-ups were perceived as riskier, than those of men, which led to lower funding. This study presented unique and unprecedented insights into how risk perceptions effect gender-based decision-making processes. Implications for women and the start-up industry have also been considered.

Keywords: gender, stereotyping, venture capital, perceived risk

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The Relationship Between Gender and Venture Capital Investments and the Mediating Effects of Risk Perceptions

Women are on the rise and they mean business.

At an increasing rate, women are starting to fill more and more managerial leadership positions while also more frequently starting to found their own businesses (Becker-Blease & Sohl, 2006). To date women represent 50% of the workforce, yet when it comes to capital and control, women appear to have extremely little of either (Wharton University, 2016). A growing body of literature has attributed this lack of managerial power and control to a *glass ceiling effect*. The concept strongly relies on the notion of unseen, yet unbreakable, artificial barriers, hindering the advancement of women and deterring them from attaining top-level corporate positions (Federal Glass Ceiling Commission, 1995). While the glass ceiling effect has often been discussed within the parameters of the traditional workforce, the notion still prevails when it comes to women in entrepreneurship[1]. As women are still considered a minority within entrepreneurial settings, their ideas are less prevalent within the start-up community than those of men (Brooks, Huang, Kearney, & Murray, 2014). With male ventures dominating, it makes it increasingly harder for women and their ideas to attain similar exposure, respect, and opportunities (Brooks et al., 2014).

The glass ceiling effect can be traced back to cognitive bias of gender stereotyping. This phenomenon refers to generalised views or preconceptions about characteristics that are, or ought to be, possessed by women in order to attain a specific position (UN Human Rights, 1996). Gender-based stereotypes reflect views on how women and men should perform within the boundaries of the roles assigned to their gender. Gender roles reflect behaviour learned by an individual as being appropriate to their gender (Blackstone, 2003). Such stereotypes and predisposed gender roles can become harmful when they limit women and men in their aspirations, personal abilities, and their pursuit of professional careers (UN Human Rights, 1996). As entrepreneurship and top-level managerial positions are still considered to require predominantly 'male' typed character traits (e.g. aggressiveness in pursuing goals and objectives, independence, and decisiveness), it significantly disadvantages women pursuing these career paths and consequently enhances the glass ceiling effect (Schein, 1973; Thébaud, 2014).

[1] For the purpose of this experimental study, the start-up environment and entrepreneurship, as well as their implications, will be used interchangeably. Explicit distinctions between the two did not reflect relevance for the purpose of this research.

Despite an incline in women founding their own businesses, research indicates that female entrepreneurs still face more challenges than their male counterparts (Becker-Blease & Sohl, 2006). For example, women are seen to struggle substantially more than men when it comes to acquiring venture capital (Buttner & Rosen, 1988). Brush (1992, 1997) as well as Carter and Allen (2003) argued that obtaining start-up capital was one of the key concerns for women-owned businesses. Early stage financing has been said to play a critical role in ensuring entrepreneurial success (Gaston & Bell, 1988; Wetzel, 1986). A lack of capital for women-owned businesses could therefore have immense implications on their organisational growth, performance, and survival (Wetzel et al., 1986).

One reason why women may receive less funding then men could be due to differences in gender-based risk perceptions. Women have often been considered to be more risk-averse than men (Schubert, Brown, Gysler, & Brachinger, 1999). This assumption has produced an increased lack of trust in women's abilities to make high-risk decisions (Shubert et al., 1999). Furthermore, society has classified risk-taking as a distinct male-typed characteristic (Shubert et al., 1999). Women who choose to engage in such behaviour may be penalised for it on the grounds of incongruent gender role expectations (Eagly & Karau, 2002). The portrayal of women's incapability of managing high risk situations, can be explicitly traced back to gender specific stereotyping. Stereotype perceptions and a lack of trust in women's risk management capabilities, could therefore potentially caution venture capitalist to invest into female endeavours. Should this truly be the case, it would suggest that women are assessed as being less competent in managing entrepreneurial risk and uncertainty, than men. Hence this could lead to women attracting lower venture capital investments.

The connection between gender, risk perceptions, and venture capital funding has not yet been examined systematically. This study will therefore address these theoretical and empirical deficiencies and will aim to evaluate to what extent gender as well as the associated risk perceptions could disadvantage women in their search for venture capital.

Theoretical Framework

The start-up environment has often been associated with a high degree of uncertainty and risk in the eyes of potential stakeholders (Koudstaal, Sloof & Praag, 2015). Therefore, these stakeholders often look for distinct character traits within the founders and/or leaders of a start-up (e.g. persistence, independence, decisiveness, risk-taking willingness) (Schein, 1973; Thébaud, 2014). These character traits have been said to increase the potential of

entrepreneurial success and have historically been classified as male-typed traits (Prentice & Carranza, 2002). The assumption that women lack similar capabilities and that they are less capable in assuring business success, may disadvantage their position within an entrepreneurial setting. Due to this lack in trust in female business capabilities stakeholders may be cautioned to invest into ventures by women. This may therefore also affect the funding amount women receive for their businesses. However, it has been claimed that when compared to traditional managerial positions, the start-up environment can potentially reduce pre-existing gender stereotypical behaviour and performance expectations, (Reskin & Roos, 1990; Ridgeway, 1997). In order to evaluate whether this assumption holds true it is vital to analyse existing gender beliefs and their implications for women in the start-up environment.

Gender Roles and Gender Status Beliefs

Beliefs about women's and men's behaviours and competencies have become extremely rigid and prove hard to overcome. Gender scholars increasingly highlight the idea of gender being an institutionalised system of social practices, categorising individuals as either being a woman or a man (Ridgeway, 1997; Ridgeway & Smith-Lovin, 1999). Organisational social roles and inequalities are then attributed based on these gender differences, transitioning into definite gender roles (Ridgeway, 1997; Ridgeway & Smith-Lovin, 1999). The distinctive characteristics with which women and men are defined, and the expectancies as to how they should behave, are a core component of this institutionalised system (Ridgeway & Correll, 2004). Contemporary gender characteristics portray women as having a lower overall competency at the things that 'matter most' within the business environment (e.g. instrumental rationality) (Ridgeway & Correll, 2004). Society appears to expect more competent task performance from men than from women (Ridgeway, 2009), and therefore view women to be less capable and competent than men in the same position (Correll & Ridgeway, 2003; Fiske et al., 2002; Wagner & Berger, 1997; Williams & Best, 1990). A 2002 study by Fiske, asked participants: "As viewed by society, how [competent, confident, capable, efficient, intelligent, skilful] are the members of this group?''. The experiment showcased that participants consistently rated women as being less capable, than men, in any given business scenario. This speaks to the fact that gender stereotypes persevere within society and consequently continue to affect judgements. When examining leadership qualities, stakeholders will often times look for agentic traits such as dedication, charisma, competitiveness, and determination; these characteristics have been regarded as being stereotypically male (Bakan, 1966). Women are

seen as being better at communal tasks such as friendliness, selflessness, and compassion, however these are often less valued than agentic traits (Fiske, Cuddy, Glick, & Xu, 2002). These deeply rooted beliefs about female and male competencies and characteristics are making it inherently difficult for women to break free from stereotypes and their implications.

To better understand the origin of gender roles and their implications within the workforce, *social role theory* proposed by Eagly (1987) postulated that human behaviour, within specific situations, is predictable and can be defined by specific roles that are based on an individual's social positions. More precisely, an individual's behaviour is dependent on the specific role they hold within their community. Deriving from this, people have stereotypical expectations about women's and men's communal and agentic characteristics and behaviours (Eagly, 1987). Eagly and Karau (2002) further argued that gender roles could be both of a descriptive and injunctive nature. Descriptive norms are often associated with an expectation of what individuals actually do; while injunctive norms reflect the expectations of what individuals should do (Cialdini & Trost, 1998). Women are expected to convey friendliness, as well as be caring, self-sacrificing, submissive, and compassionate, while their male counterparts are categorised as aggressive, dominant, ambitious, decisive, and independent (Eagly, Wood, & Diekman, 2000). Eagly and Karau (2002) elaborated on their initial work in regard to social role theory and found a distinct alignment between the perceived necessary skillset of a leader and the male gender role, ultimately creating a mismatch with the female gender role. This perceived *lack of fit* between female gender role expectations and the needed leadership capabilities is thought to give rise to the expectation that women will perform poorer in such positions (Lyness & Heilman, 2006). *Role congruity theory's* adaptation of social role theory states that individuals would be exposed to scrutiny should they not behave in accordance to what their social gender-roles dictate (Eagly & Karau, 2002). More concisely this inferred that women would be exposed to a higher degree of negative judgement and work evaluation, than men, when pursuing leadership positions. In addition to this, Eagly and Karau (2002) also predicted that women would be evaluated more negatively, than men, should they in actuality be able to attain a leadership position. Social role theory, role congruity theory, and a lack of fit model therefore all appear to reinforce the idea that women are generally seen as less capable than men when it comes to corporate leadership positions.

Another factor that can cause a disadvantage for women pursuing leadership positions is the *similarity bias*. Past research has indicated, that if confronted with a high stakes business situation, employers, investors, and stakeholders will often times draw on similarities between them and the second party to finalise decisions (Ridgeway & Correll, 2004). Ridgeway and Correll's (2004) researched showed that stakeholders are inherently drawn to individuals that exhibit similar character traits as them. This can lead to developing a greater liking to said individual. In organisational settings, this similarity bias has been a contributing factor to higher performance evaluations and job advancements (Ridgeway & Correll, 2004). As part of a belief system that privileges men over women, it often times gives men who benefit from male superiority, an incentive to nurture and maintain that system (Ridgeway & Correll, 2004). This effect can further be attributed to a bias in preferring to maintain the status quo; adjusting can be uncomfortable. When put in perspective the status quo bias as well as a similarity bias would hence subconsciously lead men, within senior positions, to assign more men for managerial and leadership purposes; making it increasingly harder for women to penetrate the glass ceiling. In the context of entrepreneurship this may lead to men preferring to support male-founded ventures rather than those founded by women. This could be highly relevant, as women-founded start-ups have secured substantially less venture capital funding than men, in the past. An investigation by Brooks, Huang, Kearney, and Murray (2014) revealed that investors were 60% more likely to award funding to male-driven organisations than to those run by women. Moreover, figures indicate that out of a total $50.8B invested through venture capitals during 2011-2013, only 3% were allocated to female run businesses (Brush, 2014). This imbalance could be due to men simply outperforming and outnumbering women, in the landscape of business and entrepreneurial ventures. However, this inequity could also serve as an indicator of a similarity bias within investment choices, given that 94% of all venture capital partners are men (Richmond, 2017).

While these statistics appear telling, to date there is not enough research to attribute the disproportional allocation of funds to one specific factor, such as gender. Therefore, there is an increased importance in investigating the distinct setting of the start-up industry and how it relates to such discrepancies within the domain of venture funding.

Salience of Gender Status Believes Within an Entrepreneurial Setting

Compared to traditional managerial positions, entrepreneurship has been said to reduce pre-existing gender stereotypical behaviour and performance expectations (Reskin & Roos, 1990; Ridgeway, 1997). Entrepreneurs are commonly not subjected to the same degree of direct supervisory authority as most managers are. Therefore, the path of entrepreneurship supposedly offers women a prospect for greater autonomy and minimised discrimination (Thébaud, 2014). This could potentially reduce interpersonal dislike and disregard for women within the industry. By eliminating the potential of a similarity bias held by top management, women may be in a better position to attain such respected and vital leadership positions. However, even within this environment, problems and hurdles for women still persevere, especially within the context of generating venture capital funding.

One obstacle that female entrepreneurs consistently encounter is their apparent lack of fit with the stereotypical image of a successful entrepreneur. Existing research supports the notion that not only leadership but also entrepreneurship is widely viewed as a male-typed task (Prentice & Carranza, 2002). Prentice and Carranza (2002) showed that gender status beliefs influence performance expectations more in the context of male-typed tasks. Concretely this means that women who engage in a male-typed task will face greater exposure to scrutiny based on gender role expectations (Ridgeway, 2009; Ridgeway & Correll, 2004). In their study Buttner and Rosen (1988) established that women were seen as less likely to succeed within an entrepreneurial setting, when compared to their male counterpart. More precisely the study indicated that in regard to typical leadership traits such as autonomy, risk taking, readiness for change, and endurance, female entrepreneurs, in comparison to males, were seen as being less likely in ensuring success (Buttner & Rosen, 1988). Buttner and Rosen (1988) are one of the few scholars who have previously investigated gender implications within entrepreneurship. Their research not only revealed that there was a strong parallel between female struggles in traditional managerial settings and those in entrepreneurship, but also that these persistent gender role expectations have the potential to effect business funding (Buttner & Rosen, 1988). While their study ultimately focused on bank loans and not on venture capital investments, their work still distinctively highlighted a discrepancy issue between females and males attaining financial support from a third party (Buttner & Rosen, 1988).

Key members of any entrepreneurs' network are potential investors. In their research Bruno and Tyebjee (1985) stated that entrepreneurs named venture capitalists as the biggest and most important source of financing. While this type of financial support may undoubtedly

be one of the most vital components in ensuring start-up success, access to networks that provide these financial opportunities may be of equal importance. Limited exposure to potential business contacts could ultimately weaken the position of an individual appealing for support. Time spent within the workforce and higher professional prominence have previously been linked to more diverse network structures (Beggs & Hurlbert 1997; Campbell 1988). Large and diversely compiled networks have also been shown to increase the likelihood of start-up success (Renzulli, Aldrich & Moody 2000). Compared to men, women tend to have more homogenous networks (Smith-Lovin & McPherson 1993); this can therefore disadvantage them in their capabilities to attain information and pursue business opportunities. To an extent entrepreneurial success is reliant on the entrepreneur's network with potential, customers, partners, investors, and other influential stakeholders (Buttner & Rosen, 1988). Yet due to the stereotype that women lack characteristics essential for becoming a successful entrepreneur, it may be substantially more difficult for them to attain access and establish links within such lucrative and important networks. Consequently, this may also limit or hinder them in acquiring financial support from venture capitalist.

Considering the numerous difficulties women face within the workforce as well as the implications of generalised gender stereotypes, it has been hypothesised that:

Hypothesis 1. Female founded start-ups will secure lower venture capital investments than male founded start-ups.

Gender Based Risk Propensity and Risk Perceptions

A common opinion concerning financial decision-making is that women possess a tendency to be more risk-averse then men (Schubert et al., 1999). The start-up environment has often been associated with a high degree of uncertainty and risk in the eyes of potential stakeholders (Koudstaal et al., 2015). This subsequently presents a need for entrepreneurs to be willing, comfortable, and efficient in dealing with business risk. The assumption that women will be more risk-averse than men has led to them receiving fewer leadership opportunities (Schubert et al., 1999). Consequently, this deficiency in opportunities has weakened female success within financial- and labour markets (Schubert et al., 1999). The idea that women are less risk-prone than men has been viewed as a primary contributor to the glass ceiling effect (Johnson & Powell, 1994).

Recognisably it is in the interest of any venture capitalist to minimise their exposure to any potential risk. Venture capital investments can be complicated and risky due to a lack in quantifiable financial- and market data. Thus, start-ups face a great risk of encountering unanticipated market shifts, new competitors, and/or substitute products (Ruhnka & Young, 1991). The effective management of business risk and making potentially risky decisions are therefore a large component in ensuring entrepreneurial success. Oftentimes female business owners are considered to be more careful and conservative in their business operations. They are said to reflect more on personal- and operational risks whereas men tend to focus on a rapid expansion (Greene, Brush, Hart & Saparito, 2001). Venture capitalists expect a funded venture to grow rapidly in terms of sales and profits (Timmons & Bygrave, 1997). Thus, this expectation is incongruent with the slower-paced, female approach. Due to this reasoning, female entrepreneurs are less trusted than men in making risky decisions which can potentially ensure corporate success (Schubert et al., 1999). Furthermore, these predeterminations about gender-based risk propensities appear to directly affect economic success. Women are often expected to be more conservative in their approaches and decisions. This assumption leads to women regularly receiving investments of a lower risk and lower expected returns (Wang, 1994). By limiting women in their access to high risk, high return funding opportunities, they are unable to demonstrate their capabilities in managing such situations. This also reasserts the notion that female founders are less equipped to run a business successfully. This can lead to a reinforced mistrust in female competencies, and therefore a further decrease in investment funding. The perceived lack of fit between women and their abilities to manage risk explains why women are expected to perform poorer in any situation that encompasses a heightened degree of risk (Lyness & Heilman, 2006). Therefore, the higher the perceived lack of fit, the higher the mistrust in female capabilities (Heilman, 2001). Hence the higher the risk, the lower the expectations in women's abilities to manage it. Should women decide to engage in such a high-risk setting regardless, a lack in trust and their perceived capabilities may discourage investors.

Hypothesis 2. The relationship between female founded start-ups and venture capital investments will be mediated by risk perception. Female founded start-ups will be perceived as riskier, leading to lower venture capital funding amounts.

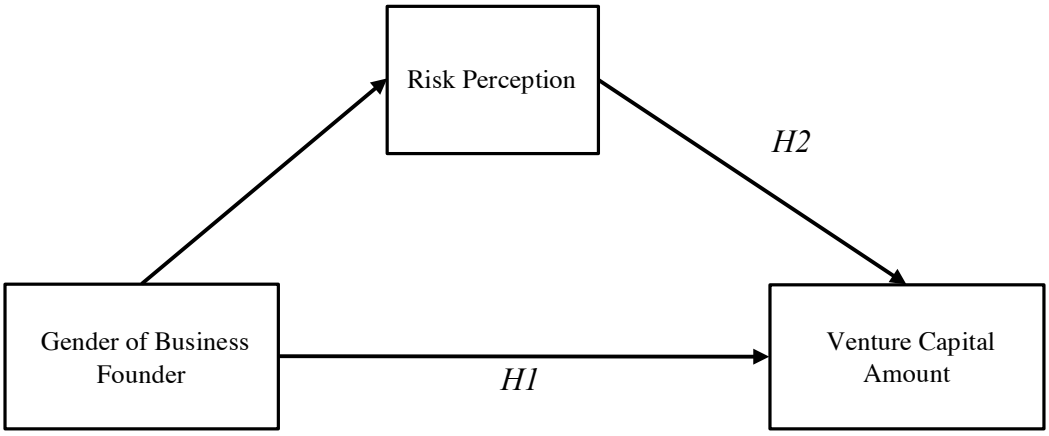

Figure 1. Conceptual model of the effects of gender and risk perception on venture capital investments.

Method

Participants and Design

As part of an online experiment a total of 315 participants (155 women, 160 men) were surveyed. They were recruited via social media networks (e.g. Facebook and LinkedIn) and their involvement was voluntary. The experiment was shared via an URL link on said networks. The average age of participants was 27.72 (*SD*=8.55), with women averaging at 26.82 (*SD*=8.39) years and men at 28.55 (*SD*=8.57) years. On average women's highest level of education was a Bachelor degree (*SD*=0.80), which was also the case for the male participants, (*SD*=0.81). In total 99 German-, 96 Australian-, and 85 Dutch participants partook in the study, with the remaining 22 participants stemming from multiple other nationalities (e.g. Austria and UK). In order to participate in the study participants had to have attended one or more business, finance, and/or entrepreneurship classes/workshops, throughout the span of their academic and/or professional career. Participants not meeting this requirement (*n*=13) were eliminated from the analysis process. The remaining participant pool (*n*=302) predominantly consisted of university students and young adults.

The experiment was conducted as part of a between-subject design. Equal numbers of participants were randomly subjected to one of two possible conditions ($n_{condition}$= 151). The independent variable of this study was the gender of the start-up founder. Venture capital funding amount was plotted as the dependant variable and risk perceptions was used as a mediator.

Measures

Risk perceptions. Risk perceptions were measured on the premise of an adapted *Domain-specific Risk-taking Scale for Adult Populations* (DOSPERT) (Blair & Weber, 2006). The DOSPERT scale provided a 7-point scale, with each point being assigned to a specific level of perceived risk. The original DOSPERT scale was designed to investigate five different types of risk and the perceptions of these (Ethical-, financial-, health/safety-, recreational-, and social risk) (Blair & Weber, 2006). However, the designed experiment presented a distinct relation to the financial environment and therefore all measurable risk perceptions focused on financial risk. All items (see Appendix B) were adopted from Blair and Weber (2006) and were slightly adjusted to better fit the experiment. 2 items (α=.88) of risk perceptions were evaluated using a 7-point scale (1=Not at all risky, 7=Extremely risky), *M*=4.05 (*SD*=1.17). Answers about perceived entrepreneurial risk (*n*=302) averaged at a 3.8 (*SD*=1.13) level, indicating investments were typically assessed to be of a "somewhat risky" nature.

Investment likelihood. The likelihood of participants investing was assessed in order to get a better understanding about their behavioural intent. Implementing this measure would show whether there was an alignment between intended behaviour and actual behaviour. This could help clarify participant's actual investment behaviour later on. The likelihood of investing was again measured with an adapted DOSPERT scale and a focus on the financial environment. 2 items (α=.64) about a scenario likelihood were assessed via the scale of 1=Extremely unlikely, 7=Extremely likely, *M*=5.23 (*SD*=1.15). The likelihood of investing averaged at a 5.1 level (*SD*=1.31), showing that there was a "slight likelihood". Both items can be found in Appendix B.

Investment amounts. The total of venture capital funds invested (*n*=302) averaged 1,044,547 (*SD*= 567,397.40) US$. This was determined by asking participants to allocate an investment amount between 0 US$ and 2,500,000 US$. Participants chose their amount via a graphic slider scale (see Appendix B).

Procedure

The experiment was conducted via Qualtrics. The time needed to complete the experiment was approximately 8 minutes. The survey in itself consisted of three main components; general information regarding participants' background, an assessment of risk

perception and the likelihood/amount of investments. After the initial welcome screen, participants were subjected to an informed consent form and information about the study. In the case of confirmed consent participants were then guided to the initial set of experiment related questions. These questions consisted of a variety of personal background queries (age, nationality, education, managerial experience). In this initial step participants were also informed that start-ups present a heightened degree of risk, both for its management and for investors. Participants were told that this increase in risk stemmed from frequent failures within the initial operating years of the start-up, as well as from unforeseen competition and inability to deliver on promised financial returns. This information was provided to them in order to ensure that they would more carefully and realistically consider their investment. Participants were also informed that in the later stages of the survey, it was very important to read the portfolios carefully as there would be no possibility of returning to the information.

After this, participants were shown a short introductory text to familiarise themselves with their role and their need to assess the potential of an investment opportunity. For the purpose of the experiment, respondents were asked to assess the business prospect while taking on the imaginary role of a potential venture capitalist. Participants were randomly assigned one of two possible portfolios, which represented the manipulation in forms of the independent variable, gender. Within these portfolios the presented entrepreneurs possessed identical qualifications (e.g. age, education, and experience) as well as gender neutral characteristics (e.g high moral for team- and independent work). Both portfolios offered a fictional capital venture investment opportunity within a gender-neutral, low-tech, sports apparel industry. 97% (n=173) of individuals who participated in a pre-test stated that they did not identify sports apparel as being female- or male typed, but rather as gender neutral. The gender of the described entrepreneur was manipulated via a change in the first name. As this experiment was conducted as a cross country study, the names of the fictional entrepreneurs (Lisa and Tom) were selected upon the basis of being common in multiple nations. This was established through a second pre-test process, conducted via the means of Facebook. This pre-test resulted in 100% of tested individual's (n=173) correctly associating Lisa with the female gender and Tom with the male gender.

Upon completing the readings about the entrepreneur, respondents were asked to answer a set of questions relating to the portfolio, and more specifically, the risk potential of it. They were also asked to assess the general likelihood of investing into the presented start-up. A further question asked as part of the portfolio evaluation was how much of an allocated

budget, participants would assign to the presented start-up. In order to avoid unfamiliar currency conversions all monetary amounts were stated in US dollars. As participation from the US was expected to be minimal, with most respondents originating in European and APAC countries, US dollars provided a communal currency that did not (dis)advantage a specific region.

Once all specific questions were answered, all partakers were thanked for their participation and were debriefed via a final Qualtrics slide.

Manipulation Check

To examine the effectiveness of the manipulation, participants were asked to indicate the gender of the entrepreneur presented in their portfolio. Further they were asked to recall whether the start-up environment was associated with a heightened degree of risk, in comparison to traditional workforce employment. They were also asked to correctly identify the industry of the start-up and the monetary amount of the investment budget. All manipulation checks were administered on separate survey slides in order to avoid participants being able to re-access and confirm information. Any respondents that failed to complete the manipulation checks correctly were excluded from further analysis.

Results

Manipulation Check

96% (n=302) of participants correctly answered all manipulation checks. However, a total of 13 participants were eliminated from the original 315 participant pool due to incorrectly answering one or more of the checks. Out of the 13 excluded participants, 39% (n=5) were omitted due to incorrectly identifying the start-up industry, 31% (n=4) failed to correctly identify their ascribed budget, and 7% (n=1) were unable to indicate the correct degree of risk associated with start-ups. The remaining 23% (n=3) were eliminated earlier on, because they had never participated in an business or entrepreneur course. It should however be noted that all initial participants (n=315) correctly identified the gender of their entrepreneur.

Analyses

To test both Hypothesis 1 and 2, model 4 of the PROCESS macro by Hayes (2013) was used. Gender of the business founder represented the independent variable, while the venture capital amount was plotted as the dependent variable. Risk perceptions mediated the

relationship between the two. The PROCESS macro (Hayes, 2013) results indicated the relationship between the gender of the business founder and the venture capital amount (c-path), the effects of gender of the business founder on risk perceptions (a-path), and the associations of gender of the business founder and venture capital amounts, through risk perceptions (c'-path). Model 4 was chosen in order to perform a mediation analysis using 5,000 bootstrapping samples as well as a 95% bias-corrected and accelerated confidence intervals in order to examine the experiment's indirect effects.

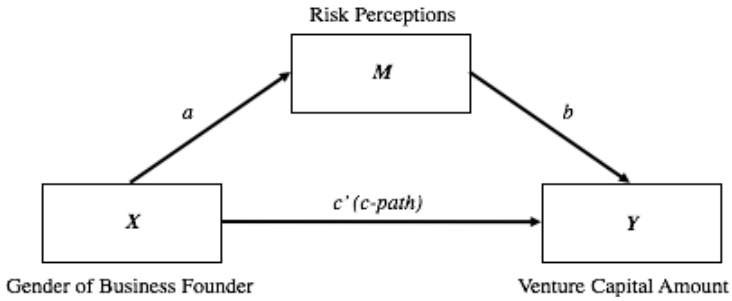

Figure 2. Direct and indirect effect of the business founder's gender on venture capital amount.

Descriptive Data Analysis

Table 1 outlines the summary statistics of the individual variables relevant to the study on hand. Invested venture capital amounts were M=1,044,547 (*SD*= 567,397.40) US$. A subsequent correlation analysis (see Appendix C) indicated a strong correlation between the entrepreneur's gender and the designated investment amount, $r(300)=.53$, $p<.001$. The female founder received *M*=739,995.33 (*SD*=400,581.81) of US$ venture capital funding while the male entrepreneur was assigned *M*=1,356,287.77 (*SD*=536,977.22) US$. Figure 3. demonstrates that the female condition pooled significantly less investments in the range of <1,250,000 US$ than the male condition. In neither condition, the full venture capital amount of 2,500,000 US$ was assigned.

Table 1. Summary Statistics

Variable	# of Obs.	Mean	Std.	Min	Max
Investment Amount	302	1044547	567397.4	0	2246228
Entrepreneurial Risk	302	3.377483	1.130911	2	6
Participant's Education	302	3.109272	0.809811	1	5
Participant's Age	302	27.71854	8.548295	18	63

Participant's average perceived risk was *M*=3.8 (*SD*=1.13). Neither in the female nor in the male condition, was the investment opportunity perceived as being "extremely risky" or "not risky at all". The results suggested a strong negative correlation both between the entrepreneur's gender and perceived risk ($r(300)=-0.40$, $p<.001$), as well as between the perceived risk and allocated investments ($r(300)=-0.69$, $p<.001$). Figure 4. further graphically demonstrates that a heightened perceived risk was associated with smaller investment amounts.

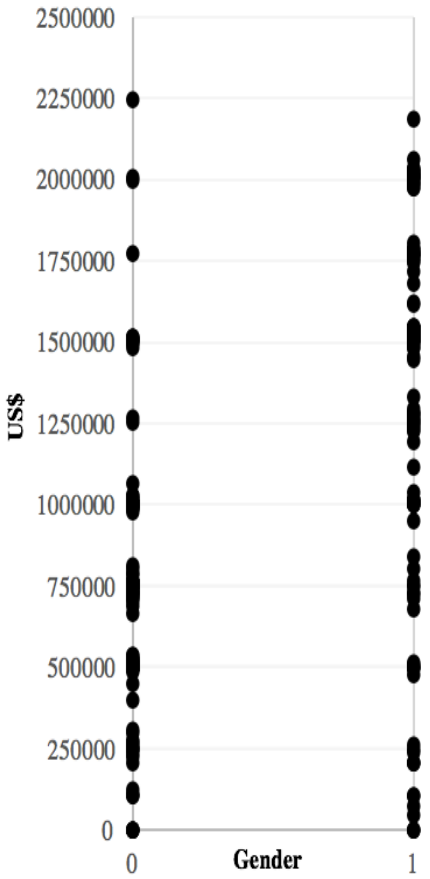

Figure 3. Scatterplot; assigned US$ dependent on gender

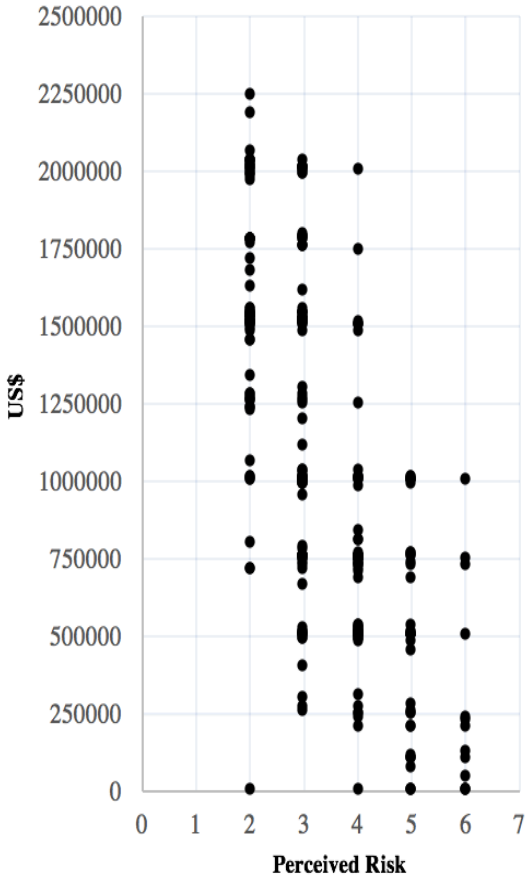

Figure 4. Scatterplot; assigned US$ dependent on perceived risk

Mediation Analysis

To investigate whether gender affects the assigned venture capital amount and if this can be explained by differences in perceived risk perceptions, a mediation analysis was performed using the procedures developed by Preacher and Hayes (Hayes, 2013). Within the analysis gender was entered as a dummy variable with the reference category 0=Female and 1=Male. Gender was then used as a predictor of venture capital funding, while perceived risk was entered as a mediator. Consequently, gender was determined as a significant predictor of

the invested amount, R^2 =.282, $F(1, 300)$= 118.03, p=.000. There was a significant total effect between the gender of the business founder and the venture capital amount (β=601989.92, SE= 55410.69, p=.000) (Table 2.), signifying that males received higher venture capital amounts than women. On average women received 601989.92 US$ less than their male counterpart. Hence, these results suggested that hypothesis 1 could not be rejected.

Table 2. Total Effect of Gender on Venture Capital Amount.

				95% Bootstrapped Confidence Intervals	
	Effect	SE	p	Lower Limit	Upper Limit
Gender	601989.921	55410.686	0.000	492947.04	11032.801

Table 3. Direct Effect of Gender on Venture Capital Amount.

				95% Bootstrapped Confidence Intervals	
	Effect	SE	p	Lower Limit	Upper Limit
Gender	344388.049	48261.903	0.000	249411.998	439364.1

Table 4. Indirect Effect of Gender on Venture Capital Amount.

			95% Bootstrapped Confidence Intervals	
	Effect	BootSE	Boot Lower Limit	Boot Upper Limit
Risk Perceptions	257601.871	32932.611	193622.987	322371.837

The direct effect (Table 3.), when adding the mediator, was also significant (β=344388.05, *SE*= 48261.90, p=.000). This indicated that gender significantly affected the venture capital amount. These results further indicated that 42.79% of the total effect could be explained through perceived risk differences.

Additionally, the total indirect effect (Table 4.) was also significant (β=257601.87, *SE*=32599.88, BCa 95% [192201.77, 321596.96]). The BCa 95% [192201.77, 321596.96] indicated that $a*b \neq 0$ and therefore signified that mediation had occurred. The results therefore showed that that a difference in perceived risk dependent on gender would affect the amount of the investment. This results further suggested a positive correlation between the independent variable of gender and the dependent variable, venture capital amount. The outcomes showed that the female condition was perceived as being riskier than the male condition and therefore received lower assigned funding. These results consequently indicate that hypothesis 2 could not be rejected. The standardised indirect effect represented a large effect (β=0.45, *SE*=0.06, BCa 95% [0.35, 0.56]).

Additional Mediation Analysis

A second mediation analysis was run in order to investigate whether gender also affected the intent to invest into a venture. It was then investigated whether this relationship would again be mediated by risk perceptions (see Appendix D). Gender (0=Female and 1=Male) was used as a predictor of investment likelihood, while perceived risk was entered as a mediator. There was a significant total effect between gender and investment likelihood (β=.62, *SE=.15*, p=.000), showing that the likelihood of investing into women was smaller, than that of men. This effect changed considerably when adding the mediator to the model, the direct effect was β=.06, *SE=.14*, p=.644, and therefore insignificant. The total indirect effect was significant (β=.56, *SE*=.10, BCa 95% [.37, .77]), indicating that perceived risk had mediated the relationship of gender and investment likelihood. These outcomes show that a difference in gender-based risk perceptions would affect the likelihood to invest into the start-up.

Discussion

Findings

The aim of this study was to examine whether gender-based risk perceptions influence venture capital funding amounts. Based on prior literature as well as social role perspective (Eagly, 1987), it was hypothesised that women would receive less venture capital funding than men. It was argued that this would be due to an influence of differences in perceived risks dependent on gender. Women were expected to be seen as having a higher perceived risk level and therefore attract lower funding, than men. In light of the results both hypothesis 1 and 2 could not be rejected, and therefore corroborated the assumption that gender-based risk perceptions would mediate the relationship between gender and funding amounts. The results signified that the perceived risk of start-ups differed depending on the gender of the entrepreneur.

Theoretical and Practical Implications

The study suggested that in the area of entrepreneurship the relations through which entrepreneurs seek financing and support for a start-up were likely influenced by gender status beliefs. While Busenitz and Barney (1997) proposed that gender-based stereotypes may appear reduced within the start-up environment, the results of this current study do not support this assumption. Instead the findings of the study support the notion that status beliefs about women and female competency expectations also arise in the setting of entrepreneurship (Aldrich & Ruef, 2006; Lounsbury & Glynn 2001). The results of this study are in line with the idea that women struggle more than men when looking for venture capital funding (Buttner & Rosen, 1988). In turn, this study indicates that entrepreneurship may still widely be viewed as a male-typed task (Prentice & Carranza, 2002) and hence, disadvantages women attempting to pursue this line of career. The broader implications of this research are that women still face a substantial disadvantage both within the traditional labour market as well as in entrepreneurship. The conducted experiment appears to corroborate the assumptions that underlying gender status beliefs still significantly affect decision making processes, specifically within environments which have been dubbed as being male-typed.

Moreover, the findings of this study appear to align with role congruity theory. The results seem to corroborate a perceived incongruity between the female gender role and that of an entrepreneur. As entrepreneurship has been viewed as a traditionally male field it supports the idea that females are less suited for such a position (Jennings & Brush, 2013). These biases can negatively affect leadership and entrepreneurial opportunities for women. Role congruity

theory may therefore be used as a tool to rationalise why women aren't seen as strong start-up leaders. As part of these study's findings, incongruent gender role behaviour appeared to reduce the evaluation of women as a successful entrepreneur. Furthermore, risk-taking and risk management were described as important character traits for an entrepreneur to possess. This study distinctly showed that women were trusted less in the presence of risk, than men. Therefore, this presented another factor where women seemed to present incongruity with the entrepreneurial role. Consistent with this, the findings of this study showed how role congruity theory may bias investors toward expecting low entrepreneurial success from female start-up founders. This may in turn also explain why men appear to have an advantage in securing (higher) venture capital funding than equally capable women. What this study showed was that due to gender role expectations and anticipated congruency with these, women received less venture capital funding than men. This not only weakens their position in the start-up environment but also drastically decreases the chances of the start-up becoming economically sustainable. Henceforth this creates a vicious cycle; with a lack of funding, women are unable to ensure success and demonstrate great leadership capabilities. In turn, this strengthens the notion that women are incongruent with leadership positions, leading to even less trust in them and their competencies.

An additional interesting finding of this study is the fact that investment likelihood also varied depending on gender. This shows that not only the assigned investment amount but also the intent to invest was influenced by gender perceptions. Subsequently this suggests that stereotypes and conceptions about gender are activated early on in the decision-making process. This makes it inherently harder to change the outcomes of actual investment behaviours. Furthermore, this study showed that the intent to invest into a venture not only varied according to gender, but again also because of risk perceptions associated with the gender. This established another significant disadvantage for women. With these findings in mind, it is imperative that venture capitalists are educated on potential biases in their decision-making processes. Ruef, Aldrich and Carter (2003) showed that venture capital industry and the associated entrepreneurial networks are very homophilic. Therefore, an increase of women in the venture capital environment may help female entrepreneurs to form more strategic connections. This could help normalise the image of women within the start-up industry and therefore potentially minimise bias against them.

Limitations and Future Research

A limitation of this study is that possible gender-stereotypical beliefs of the participants were not measured prior to the experiment. Should participants have had preconceived stereotypes or strong opinions about gender roles, these could not be accounted for in the experiment. However, the impact of such stereotypes may have been limited as participants were not told that the experiment manipulated gender. Therefore, gender stereotypes were not explicitly activated, potentially reducing the effects of conscious discrimination against one specific gender.

The participant sample presented another limitation as the participation pool mainly consisted of students and young adults, with an average age of 27.7 years. This may have limited the level of exposure participants had previously experienced in respect to leadership, workforce experience, and most importantly to strategic investment decisions. This ties in with a concrete recommendation for future research. It is urged that the study on hand is replicated in a controlled setting with a distinct sample of venture capitalists. Furthermore, replication should also be performed as part of a laboratory experiment rather than an online survey. Due to the fact that participants of this specific study were given the opportunity to complete an online questionnaire, there was a lack in controllability in regard to the conditions and the environment of the participation. A laboratory study would therefore account for higher controllability of the participation circumstances.

Another limitation that needs to be addressed is that of mediating circumstances. While this study showed that risk perceptions partially explain why women receive less venture capital funding, than men, it does not reveal why gender differences in venture capital decisions exist. While past academic work has focused on stereotyping and their effects on female advancements within the workplace, future research should continue to investigate (other) mediating factors. Upcoming studies could for example examine the mediating circumstances of pre-existing gender-stereotypical beliefs. This could potentially determine where and how strong gender-based opinions originate and how they are developed. In turn, this may enable minimising the harm such stereotypes can have on work advancements and workplace behaviour. Consequently, these insights may contribute to closing the gender gap within the workforce.

Conclusion

This study showed that within the start-up environment the relations through which entrepreneurs seek financing and support were substantially influenced by gender. More precisely this study showed that the allocation of funding was further affected by gender-based risk perceptions. This led to women receiving an average of 53.14% lower venture capital offers than their male counterparts. These results could have significant implications for the success of female founded start-ups. The difference in assigned amounts could partially be explained by gender specific risk perceptions and the stereotypical assumption that women are more risk averse than men. The results of this study were predominantly aligned with the finding of past research. However, the majority of past academic research has focused solely on examining gender differences within a more traditional workforce setting. This study on the other hand, focused on the importance of investigating gender roles outside the traditional workforce environment. Therefore, this study presented unique and innovative insights into how gender beliefs could translate to the entrepreneurial setting. This study focused on examining actual behaviour, strengthening the implications of this work. The variables of this experiment have previously never been examined as part of one distinct empirical study. This makes this study the first of its kind in examining the mediating effects of risk perceptions, providing a valuable reference for future research into this area of expertise.

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Appendix A

Entrepreneurial Profile Presented within Survey

The Start-up Investment Opportunity:

Early Bird Inc. is a star-up creating and selling reflective sports apparel. The wide range of shirts and pants are all equipped with reflective patterning, allowing for joggers to be seen in the dark. The product range is targeted at running enthusiast, often exercising before work and the break of dawn. Research conducted on behalf of Early Bird Inc. has shown that the product range promises a decrease in vehicular accidents involving pedestrians, within the hours of 4.30am-7.00 am and from 8.00pm-12.00am.

Additional market analysis has shown that Early Bird Inc. has created a new and innovative approach to sporting apparel, and currently faces little to no competition within the industry. However, other large and reputable sports apparel brands are expected to enter the reflective wear market within the next 1-2 years.

The Early Bird Inc. start-up is currently looking for venture capital investors and aims to raise a total of US$7,500,000 through this line of funding.

Additional Relevant Information:

Early Bird Inc. was founded by (entrepreneur's gender) entrepreneur (entrepreneur's first name) Smith in early 2017. Prior to founding, managing, and growing the company, she worked within the sport apparel industry for seven years.

Other relevant information about the entrepreneur:

- Bachelor Degree in Management from a well-known and respected university
- Managerial experience
- Self-proclaimed leader and strong communicator
- High moral for team- and independent work

Appendix B

Survey Questions Relating to Mediation Analysis

Survey questions for adjusted DOSPERT risk perception analysis (2 items).

How risky do you perceive an investment into (entrepreneur's first name) start-up to be?

1. Not At All Risky
2. Slightly Risky
3. Somewhat Risky
4. Moderately Risky
5. Risky
6. Very Risky
7. Extremely Risky

How risky do you perceive investing your entire US$2,500,000 budget into (entrepreneur's first name) start-up to be?

1. Not At All Risky
2. Slightly Risky
3. Somewhat Risky
4. Moderately Risky
5. Risky
6. Very Risky
7. Extremely Risky

Survey questions for adjusted DOSPERT likelihood analysis (2 items).

What is the likelihood of you investing in (entrepreneur's first name) start-up?

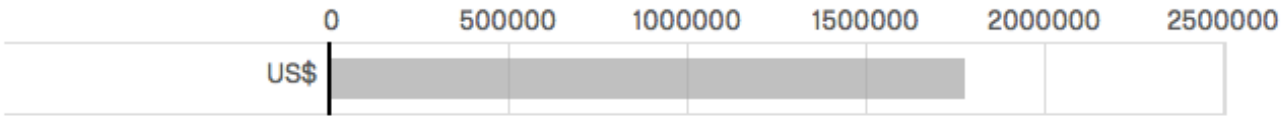
1. Extremely Unlikely
2. Moderately Unlikely
3. Slightly Unlikely
4. Neither Likely Nor Unlikely
5. Slightly Likely
6. Moderately Likely
7. Extremely Likely

In your opinion, what is the likelihood the entrepreneur (entrepreneur's first name) will be able to adequately manage business related risks?

1. Extremely Unlikely
2. Moderately Unlikely
3. Slightly Unlikely
4. Neither Likely Nor Unlikely
5. Slightly Likely
6. Moderately Likely
7. Extremely Likely

Survey questions for analysing investment amounts (1 item).

How much of your US$2,500,000 budget would you invest into (entrepreneur's first name) start-up?



Appendix C

Analysis of Correlation and Covariate Effects

Table 5. Correlation Analysis

Correlation	Investment Amount	Entrepreneurial Risk	Entrepreneur's Gender	Particpant's Education	Participant's Age	Participant's Gender
Investment Amount	1					
Entrepreneurial Risk	-0.6848	1				
Entrepreneur's Gender	0.5314	-0.4047	1			
Participant's Education	0.0575	0.0491	-0.0205	1		
Participant's Age	-0.0186	0.1004	-0.0275	0.2271	1	
Participant's Gender	0.0136	0.0513	-0.0066	0.0479	0.1011	1

Table 6. Pearson Correlation Analysis

Correlations			
		Gender	VC Amount
Gender	Pearson Correlation	1	.531**
	Sig. (2-tailed)		0.000
	N	302	302
VC Amount	Pearson Correlation	.531**	1
	Sig. (2-tailed)	0.000	
	N	302	302

** correlation is significant at the 0.01 level (2-tailed).

Table 7. Total Effects Model with Covariates

	Effect	SE	t	p	Lower Limit	Upper Limit
Constant	616001.728	134292.996	4.587	0.000	351715.265	880288.19
Entrepreneur's Gender	603105.901	55510.3168	10.8648	0.000	493862.488	712349.314
Participant's Gender	17960.4098	55831.7007	0.3217	0.748	-91915.482	127836.301
Participant's Age	-1462.4846	3353.2448	-0.4361	0.6631	-8061.6166	5136.6474
Participant's Education	50877.8118	35249.9672	1.4433	0.15	-18493.558	120249.182

Appendix D

Mediation Analysis of Investment Likelihood

Table. 7 Direct Effect of Gender on Investment Likelihood

				95% Bootstrapped Confidence Intervals	
	Effect	SE	p	Lower Limit	Upper Limit
Gender	0.064	0.139	0.644	-0.209	0.338

Table 8. Total Effect of Gender on Investment Likelihood

				95% Bootstrapped Confidence Intervals	
	Effect	SE	p	Lower Limit	Upper Limit
Gender	0.623	0.146	0.000	0.338	0.910

Table 9. Indirect Effect of Gender on Investment Likelihood

			95% Bootstrapped Confidence Intervals	
	Effect	BootSE	Boot Lower Limit	Boot Upper Limit
Risk Perceptions	0.558	0.102	0.371	0.77