

**Does Gender Matter?
Entrepreneurs and Funding Outcomes**

by

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University of Pittsburgh, 2023

Motivated by the gender disparity in early-stage entrepreneurial funding, my research seeks to understand how entrepreneurial characteristics affect entrepreneurial funding. Based on theories in entrepreneurship, strategic management, psychology, and behavioral economics, I use a mixed-method approach to understand how an entrepreneur's or investor's cognitive behaviors affect their funding and how this relationship is moderated by the entrepreneur's gender. The first paper examines how an entrepreneur's display of cognitive biases, specifically overconfidence, illusion of control, and generalizing from small numbers, affected the amount of funding they received and how this relationship is moderated by the entrepreneur's gender. The second paper focuses on understanding how an entrepreneur's display of grit is perceived and rewarded by investors through the entrepreneur receiving a deal and whether this reward differs based on the entrepreneur's gender. The third paper explores how the risk tolerance of the investor impacts their funding decisions, specifically regarding the gender of the entrepreneurs they choose to invest in. For these studies, archival data was collected from ABC's Shark Tank and CB Insights. To supplement these findings, experimental data was also gathered using Amazon's Mechanical Turk. These studies suggest that female entrepreneurs who can demonstrate attributes typically associated with male entrepreneurs may be able to significantly positively affect their funding outcomes. The aim of these studies is to offer both impactful theoretical and practical contributions to the literature on gender and entrepreneurship and insights on how to improve the way entrepreneurs present themselves when seeking funding.

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Preface

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1.0 Introduction

Every year, over 100 billion dollars of early-stage venture capital funding are granted to entrepreneurs. It's important to note that of those seeking funding, 40% are ventures founded by women. Yet, only 2-3% of the total funding goes to female-led ventures, even after accounting for funding amounts, industries, and other factors that may affect the decision-making process (Global Entrepreneurship Monitor, 2016). This persistent and significant disparity in funding outcomes suggests that there may be a preference among investors for male-led ventures, leading to a lack of opportunities for women to access capital and build their businesses.

However, there is less information as to why investors exhibit a bias towards male entrepreneurs, and whether measures can be taken to provide equal opportunities for female entrepreneurs. This investor preference is often unintentional and may be linked to characteristics that entrepreneurs display during their pitch. The purpose of this research, comprised of three papers, seeks to understand how entrepreneurial characteristics affect entrepreneurial funding. Based on theories in entrepreneurship, strategic management, psychology, and behavioral economics, this research uses a mixed-method approach to understand how an entrepreneur's or investor's cognitive behaviors and characteristics affect their funding and how this relationship is moderated by the entrepreneur's gender.

The first paper examines the relationship between an entrepreneur's display of cognitive biases, the entrepreneur's gender, and funding outcomes. Focusing on cognitive biases associated with entrepreneurs; overconfidence, the illusion of control, and generalizing from small numbers, a dictionary approach was utilized to analyze the linguistic display of the biases in entrepreneurial pitches and the impact on funding amounts. Archival data was collected from the

TV show "Shark Tank", along with experimental data from Amazon's Mechanical Turk. The results suggest that female entrepreneurs who exhibit characteristics typically associated with male entrepreneurs may increase their chances of securing funding.

The second paper explores the relationship between an entrepreneur's display of grit, the perceived level of grit by the investors, the entrepreneur's gender, and funding outcomes. This study uses archival data from "Shark Tank", along with experimental data from Amazon's Mechanical Turk, to examine how the perception of displayed grit affects the likelihood of receiving funding and whether this reward differs based on the entrepreneur's gender. The findings suggest that female entrepreneurs who are perceived as having higher levels of grit may increase their chances of securing funding.

The third paper investigates how the risk tolerance of investors affects their funding decisions, particularly regarding the gender of the entrepreneurs they invest in. Additionally, this paper seeks to understand the role of gender homophily between the investor and entrepreneur and its impact on the investor's funding decisions. Motivated by findings in the experimental data, archival investment data was collected from CB Insights to examine how investor risk tolerance affects funding outcomes for male and female entrepreneurs. The findings suggest that investors with higher risk tolerance are more likely to invest in female entrepreneurs. Furthermore, the study finds that while gender homophily has little impact for male entrepreneurs, it significantly impacts female entrepreneurs, such that female entrepreneurs are more likely to be funded by female investors than male investors.

Overall, the research highlights the impact of entrepreneurial characteristics displayed during the pitch on funding outcomes and how gender moderates this relationship. The findings suggest that female entrepreneurs who can exhibit characteristics often associated with

successful male entrepreneurs may increase their chances of securing investor funding. The research offers theoretical and practical contributions to the literature on gender and entrepreneurship and provides insights into how entrepreneurs can improve their chances of securing funding based on how they present themselves when seeking funding.

2.0 Paper 1: Does Gender Matter? Cognitive Biases and Entrepreneurial Funding

Entrepreneurs unconsciously use and exhibit cognitive biases in the creation and presentation of their nascent ventures to investors. We examine how an entrepreneur's unconscious display of three cognitive biases (overconfidence, illusion of control, and generalizing from small numbers) may impact investor funding. We explore the relationship between the display of these biases, the amount of funding an entrepreneur receives, and whether both genders are equally rewarded for the unconscious display of the entrepreneur's gender. The results of our mixed-method study, using content analysis and experimental data, suggest that the entrepreneur's unconscious display of cognitive biases can influence the amount of funding an entrepreneur receives. Moreover, this study finds that the relationship is significantly moderated by the entrepreneur's gender.

2.1 Introduction

Owing to a lack of historical or financial data, entrepreneurs must find ways to overcome uncertainty to attract investors to their nascent ventures. Entrepreneurs aim to present a positive image of themselves to gain the support of others (Parhankangas & Ehrlich, 2014). Cognitive biases, which are an unconscious, systematic manner of thinking and are otherwise known as "System 1 thinking," allow individuals to make quick decisions with limited data (Kahneman, 2011b). Traditional business literature has suggested that individuals who display cognitive biases are irrational, lack in judgment, and have distorted views of their abilities and skills (Dhir

& Mital, 2012; Tversky & Kahneman, 1974). However, research in entrepreneurship has shown that these unconscious cognitive biases benefit entrepreneurs in decision-making contexts where uncertainty is present (Alvarez & Barney, 2007; Busenitz & Barney, 1997).

Unlike literature that has suggested that decisions should be made through a slow, complete, and rigorous thinking process (Kahneman, 2011b) and viewed individuals who display cognitive biases as detrimental to firms, research into entrepreneurship has suggested that unconsciously displaying biases such as overconfidence, the illusion of control (IoC), and the ability to generalize from small numbers, can benefit entrepreneurs when they make decisions and present their ideas to others (Bear & Rand, 2016; Busenitz & Barney, 1997; Jagau & Van Veelen, 2017; Simon et al., 2000). Cognitive biases can help entrepreneurs to mitigate the perceived riskiness of their ideas, convince others of the validity of nascent endeavors, and navigate uncertain terrain as they adapt to and overcome obstacles. Displaying cognitive biases during funding presentations may allow entrepreneurs to demonstrate their abilities to make decisions and act when faced with uncertainty, as well as convey their belief in the potential success of an endeavor.

However, little is known about whether unconsciously displaying cognitive biases results in increased funding. Entrepreneurs who unconsciously display cognitive biases when they present their ideas to others could be exhibiting attributes that investors value (Bolino et al., 2008; Jennings & Brush, 2013). If these biases are unconsciously displayed and perceived by investors, they might account for differences in funding decisions. Furthermore, much of the research on entrepreneurs and cognitive biases has neglected to consider the gender of the entrepreneur. Studies have implicitly assumed that the entrepreneur is male, an assumption that is supported by the significant funding disparity in male and female entrepreneurs' funding, which favors male-

led ventures (Brush et al., 2018; Busenitz & Barney, 1997; Malmström et al., 2017; Zhang et al., 2020). Management and psychology studies examining whether a person's gender influences their biases have found that, while both genders can exhibit biases, they do so differently (Mishra & Metilda, 2015). These studies have observed that men demonstrate a higher level of overconfidence and IoC than women (Barber & Odean, 2001). However, despite the differences in how men and women unconsciously demonstrate these cognitive biases, there is little information on whether these biases are rewarded or whether male and female entrepreneurs are rewarded equally.

Using Dual Process theory (Kahneman, 2011b), this paper aims to understand whether entrepreneurs' unconscious displays of cognitive biases when they seek funding are rewarded. Further, the paper examines whether an entrepreneur's gender impacts the reward that the entrepreneur receives when displaying cognitive biases during funding presentations. Using both within and between gender groups we explore whether male and female entrepreneurs receive different amounts of funding when they exhibit these biases. The findings of this paper suggest that entrepreneurs' unconscious displays of cognitive biases impact their funding outcomes, and that the entrepreneur's gender moderates the relationship.

The context of this study is pitch competitions because they allow for the observation of the display of cognitive biases and the effects of gender differences on funding outcomes (Beckmann & Menkhoff, 2008; Malmström et al., 2017). To test the hypotheses, we adopted a mixed-method research approach using both content analysis and experiments. We gathered data by analyzing the content of transcripts from ABC's *Shark Tank* (Fuchs, 2014) and tested the effects of biases on funding decision outcomes. We followed this study with an experimental study to isolate each bias and test the effects of the biases on the amount of funding received.

This research makes three contributions. First, our study examines whether entrepreneurs' displays of cognitive biases are rewarded in business funding outcomes. Second, our study contributes to the literature on entrepreneurship and gender by showing that the gender of the entrepreneurs makes a difference to how the entrepreneurs' display of cognitive bias is rewarded. Third, our study develops a novel linguistic method to measure the presence of cognitive biases.

This paper begins with a discussion on the role of the dual process theory in funding decisions and its relationship with cognitive biases. Next, we consider the effects of gender and entrepreneurs' displays of cognitive biases on funding. Subsequently, we explain our methods and present our results. We conclude the paper with a discussion of the findings, implications, and avenues for future research.

2.2 Dual Process Theory and Cognitive Biases

2.2.1 Introduction to the Dual Process Theory

When making decisions, individuals rely on a method of processing information to analyze any available data. Dual process theory stipulates that, depending on the time and information available to make a given decision, two different cognitive processes— System 1 and System 2—are used in decision-making situations. System 1, an intuition-based style of processing information, is described as a rapid, automatic, and unconscious style of thinking that encompasses many different cognitive decision-making processes (Bago & De Neys, 2017; Evans, 2006; Kahneman, 2011b). These spontaneous and intuitive decisions are not easily

replicable and tend to have a high rate of failure owing to the variability of outcomes. Traditional business methods support the use of System 2 processing, which involves a slow, deliberate, and conscious decision-making process (Kahneman, 2011b). Through System 2 processing, individuals gather and process information by means of a rigorous analysis, which is often based on earlier System 1 decisions, to formalize how decisions should be made based on prior data and facts (Puglisi et al., 2021). By basing decisions and actions on concrete information, managers and decision makers make seemingly more rational and supported choices (Stanovich & West, 1998). However, this System 2 processing only works when tasks are well defined, and information is available. Many decisions are unable to be made in this manner, and in such situations, individuals must therefore rely on System 1 processing, which allows for the analysis and processing of complex models and ideas, while System 2 can only process simple or well-ordered models (Kahneman, 2011b).

2.2.2 The Dual Process Theory and Entrepreneurial Actions

Entrepreneurs are not traditional decision makers and are often forced to make decisions when there is a significant lack of information or data (Alvarez et al., 2018). This decision making under conditions of uncertainty is due, in part, to their venture's degree of infancy, the untested market, and the unknown customer demand (Shepherd et al., 2000). Since the business environment is becoming increasingly complex and unpredictable, entrepreneurs require alternatives to the perceived rational and analytical thinking style that comprises System 2 processing (Puglisi et al., 2021).

Therefore, in addition to using the System 2 processing style, entrepreneurs use the System 1 processing approach to aid in creating their new ventures. For example, an entrepreneur could

use System 2 processing to complete an application for a pitch competition and System 1 processing when presenting their nascent venture to investors. By basing their decisions and actions on their own experiences and intuition, entrepreneurs create potential business opportunities that would otherwise not have been possible (Puglisi et al., 2021). When making and implementing decisions, not only do entrepreneurs consider the concrete available information, but they also incorporate cognitive factors, such as the lessons and behaviors that they have learned from past experiences. Since System 1 processing, a manner of thinking formed based on past experiences and interactions, allows for the inclusion and use of cognitive biases, it allows entrepreneurs the freedom to create new products and services that they could not have created if they had only acted when they had complete information.

2.2.3 Dual Process Thinking and Entrepreneurial Pitches

To obtain formal funding from investors, entrepreneurs often give pitch - a presentation during which they provide “an overview of the business plan to potential investors” (Brooks et al., 2014). These pitches typically include information about the founding team, the new venture, and the expected sales. However, investors must often make funding decisions with incomplete information. As such, the investors must utilize the System 1 processing approach and incorporate their intuitions, experiences, or “gut feelings” into their funding decisions (Huang & Pearce, 2015). Investors consider both the details presented during the pitch, such as the requested funding amount, and the characteristics of the entrepreneurs themselves, including the entrepreneurs’ motivational cues (Cardon et al., 2017), their passion and drive (Murnieks et al., 2016), and information about the founding team (Bernstein et al., 2017).

We extend this literature to include entrepreneurs' unconscious displays of cognitive biases as a factor that investors consider when making their funding decisions. Cognitive biases are formed through a person's past experiences and rely on the use of their intuition and "gut feeling." Displaying cognitive biases can therefore be classified under System 1 processing, as biases do not constitute a formal analytical process that can be replicated with consistent outcomes. When creating their ventures and making decisions, entrepreneurs rely on System 1 processing to overcome the issue of incomplete data. As such, these decisions, or the outcomes of these decisions are noticeable during the entrepreneur's pitch, providing additional subjective information that investors can incorporate into their decision-making process.

2.3 Entrepreneurs and Cognitive Biases

Entrepreneurs rely on cognitive biases when making decisions and creating their ventures. Three biases, which have been well documented in the literature on entrepreneurship and are often associated with entrepreneurs, are overconfidence, illusion of control, and generalizing from small numbers (Busenitz & Barney, 1997; Jennings & Brush, 2013; Simon et al., 2000). Through the display of these biases, entrepreneurs can suggest that they have characteristics valued by investors.

2.3.1 Introduction to Cognitive Biases

Cognitive biases are a manner of thinking that allows individuals to make quick decisions with limited information (Kahneman, 2011b). They are typically considered to be detrimental to

decision-making as they are thought to cause deviations from perceived rational judgment (Tversky & Kahneman, 1974). Researchers believe that when information is available, individuals need to base decisions on a rational decision-making process that is comprehensive, quantitative, and time-consuming (Kahneman, 2011; Stanovich and West, 1998). However, when decision-making contexts are not well-structured, and the possible outcomes of the decisions are unknown, individuals often rely on a rationale that leads to creative, subjective, and intuitive decisions (Kahneman, 2011; Stanovich and West, 1998).

Scholars argue that in business settings, the use of biases instead of objective data is disadvantageous for the business and is linked to issues of firm survival (Camarero & Lovullo, 1999; Gudmundsson & Lechner, 2013; Kahneman, 2011a; Malhotra et al., 2015). Moreover, researchers hypothesize that leaders who use cognitive biases in their decision-making processes are often considered irrational and are said to have a distorted view of their skills and abilities (Dhir & Mital, 2012; Tversky & Kahneman, 1974). However, while using cognitive biases may seem irrational to outsiders, they can be rational in specific situations (Alvarez & Barney, 2007; Busenitz & Barney, 1997; Gigerenzer, 2008; Miller, 2007). In uncertain contexts, individuals display cognitive biases when making decisions as they can be beneficial in reducing perceived uncertainty (J. B. Smith et al., 2002).

2.3.2 Entrepreneurs' Unconscious Displays of Cognitive Biases

The unconscious use and display of cognitive biases may be considered a strength in entrepreneurs. The use of cognitive biases is a significant differentiating factor between entrepreneurs and non-entrepreneurs (Alvarez et al., 2013; Busenitz & Barney, 1997).

Entrepreneurs operate in situations where they have incomplete information; the outcomes of

their ventures are unknown; and they are highly prone to failure. Entrepreneurs often do not have the necessary information to make comprehensive, time-consuming decisions. Instead, entrepreneurs use cognitive biases to make decisions with the limited amount of information available to them (Busenitz, 1999). Through cognitive biases, entrepreneurs can continue to act and advance their ventures, a pivotal aspect of success when launching a product or service in an ever-changing market (Bear & Rand, 2016; Jagau & Van Veelen, 2017; Zhang et al., 2020).

Entrepreneurs display cognitive biases when presenting their endeavors to others, as each endeavor is created from the entrepreneurs' decisions and actions. The cognitive biases that entrepreneurs display may demonstrate attributes of a successful entrepreneur to their audiences and help to convince others of the validity of their ventures (Aldrich & Fiol, 1994; Simon et al., 2000).

2.3.3 The Benefits of Funding for Displaying Cognitive Biases

Entrepreneurs are commonly associated with the following cognitive biases: overconfidence, IoC, and GSN (Busenitz & Barney, 1997; Simon et al., 2000). For their pitches to be successful, entrepreneurs must demonstrate the potential of their products or services, show their knowledge of target customers and markets, and address the possible challenges that they could face (Shyti, 2013). To appear more motivated, better informed, and convince potential investors of their belief in the creation and value of their products and services, as well as their ventures' potential success, entrepreneurs unconsciously display cognitive biases when they justify their decisions and present their ventures to the investors (Ahearne et al., 2008; Nouri et al., 2018).

However, while we know that entrepreneurs unconsciously use and display cognitive biases, we know less about whether investors reward entrepreneurs for the latter's displays of such

biases. An investor could view an entrepreneur's display of cognitive biases negatively, believing that the entrepreneur is boastful, arrogant, difficult to work with, or difficult to coach. Nonetheless, by displaying cognitive biases that are common to entrepreneurs during their pitches to investors, entrepreneurs can also demonstrate that they possess the attributes that investors value. As investors incorporate subjective information into their evaluations of entrepreneurs, the entrepreneurs' displays of cognitive biases may help investors to determine the validity of the entrepreneurs' nascent endeavors (Huang & Pearce, 2015; Parhankangas & Ehrlich, 2014). By unconsciously displaying cognitive biases when they present their entrepreneurial endeavors to investors, entrepreneurs can alter investors' images of them and influence investors to provide more favorable financial rewards (Ellis et al., 2002; Nagy et al., 2012).

2.3.4 Overconfidence

An overconfidence bias is when individuals are overly optimistic about the outcomes of their decisions and are slow to incorporate additional information owing to their belief in their initial assessments (Busenitz & Barney, 1997). Overconfidence has been studied in multiple research fields, including behavioral economics (Camerer & Lovallo, 1999; Campbell & Sharpe, 2009; Tversky & Kahneman, 1974) and business strategy (Ferris et al., 2013; Malhotra et al., 2015; Malmendier & Tate, 2008; Powell et al., 2011). In most traditional settings, overconfidence is considered to be detrimental to managers (Kahneman, 2011a; Schwenk, 1982). Overconfidence has shown to be a factor in managers making questionable decisions, undertaking value-destroying actions such as mergers, and faulted for the decline of the firm due to taking unnecessary risks (Camerer & Lovallo, 1999; Dhir & Mital, 2012; Malhotra et al., 2016).

Unlike traditional business managers, an entrepreneurs' overconfidence may be considered beneficial because it allows entrepreneurs to take actions that could otherwise appear unjustified. Such actions can result in entrepreneurs gaining an advantage that they would otherwise have missed (Busenitz & Barney, 1997). Overconfidence allows entrepreneurs to convince others of their knowledge of subject areas (Anderson et al., 2012; Blavatsky, 2009). By taking bold actions and convincing others of the actions' validity, entrepreneurs who demonstrate an overconfidence paint themselves as attractive investment opportunities and, because they can have an advantage over other entrepreneurs, may be more likely to receive investor funding.

Furthermore, entrepreneurs who display overconfidence demonstrate their boldness and willingness to take risks. This may align with investors as investors who invest in nascent start-ups tend to have a higher risk tolerance and are willing to bet on high-risk endeavors. This demonstration of overconfidence, therefore, may make investor more likely to invest and to invest at a higher rate. We, therefore, posit the following:

***Hypothesis 1a:** Entrepreneurs who display overconfidence during their pitches receive more funding than those who do not.*

2.3.5 Illusion of Control

IoC occurs when entrepreneurs believe that they have more control over situations than is possible (Simon et al., 2000), e.g., predicting the future. While IoC is closely related to overconfidence, it includes perceived control of areas outside of one's control, such as what another person or competitor may do or how the market will react (Langer, 1975). Yet IoC is also associated with managers overestimating their ability and the control they have over their company. Managers with an IoC may forgo contingency plans, falsely believing that they can

control the outcome of their business strategy or that through additional effort they will succeed, no matter the obstacle (Langer, 1975; Schwenk, 1982). Traditional business managers with IoC are seen to be detrimental to the company as they may prevent the company from reaching success due to their belief in the ability to control the unknown.

However, entrepreneurs operate with greater levels of uncertainty, introducing a product or service to market (Shepherd et al., 2000), and must therefore rely on their own IoC to push their nascent venture to success. Entrepreneurs who express IoC can convey a certainty for the outcomes of their endeavors that do not exist. Their products or services are new, providing little historical information from which to demonstrate the ability to handle surprises from environmental externalities. IoC may suggest to investors that an entrepreneur has more knowledge and control over the future outcome than is truly the case (Parhankangas & Hellström, 2007), reducing the perceived level of risk in the investment. Even though the future of the endeavor is unknown, lowering the investment's perceived level of risk while still promising high returns due to the novelty of the product makes the investment appear more appealing than other investment opportunities. This leads to our next hypothesis.

***Hypothesis 1b:** Entrepreneurs who display an illusion of control during their pitch receive more funding than those who do not.*

2.3.6 Generalizing from Small Numbers

GSN is the willingness to use a few¹ attributes or observations of a specified phenomenon to make larger inferences and predictions about people or phenomena as a whole, with little to no weight being placed on prior outcomes or sample size (Busenitz & Barney, 1997; Tversky & Kahneman, 1974). Studies find that entrepreneurs are significantly more willing to generalize based on small, nonrandom samples, such as social interactions and past experiences, than managers in large organizations (Busenitz & Barney, 1997). Managers who generalize from small numbers are viewed as being insensitive to the probability that the same they use is representative of the market as a whole (Schwenk, 1982). This can be detrimental in business settings as there is little to no formal data or market research to back up these decisions (Galavotti et al., 2021).

However, the ability to do this demonstrates self-reliance and implies knowledge about unseen problems and potential solutions, which can be highly beneficial for entrepreneurs. This enables entrepreneurs to identify and create unique opportunities that may provide a competitive advantage (Busenitz & Barney, 1997). This can make their products and services more attractive to investors due to a higher potential for return-on-investment, increasing an entrepreneur's chances of receiving funding. Thus, our next hypothesis follows.

***Hypothesis 1c:** Entrepreneurs who generalize from small numbers during their pitches receive more funding than those who do not.*

¹ Studies tend to refer to a sample size greater than 1 (Busenitz & Barney, 1997; Tversky & Kahneman, 1974). Therefore, we operationalize this definition as using a few, or more than one, attribute or observation

2.4 The Impact of the Gender of Entrepreneurs

2.4.1 Gender Differences

In entrepreneurship, many studies have assumed that findings relating to entrepreneurs are equally applicable to both male and female entrepreneurs (Busenitz et al., 2003; Jennings & Brush, 2013). Research has suggested that the differences between the gender groups have been neglected owing to a lack of female entrepreneurs seeking formal funding (Brush et al., 2018; Jennings & Brush, 2013). However, gender differences do exist. Men and women are shown to differ in their methods for starting ventures (V. K. Gupta et al., 2014; Ljunggren & Kolvereid, 1996), the ways in which they primarily seek funding (Brush et al., 2018; Jennings & Brush, 2013), and in their definitions of success (Lubinski et al., 2014). Additionally, men and women pitch their ventures differently (Balachandra et al., 2019; Brush et al., 2018; Kanze et al., 2018), and they display cognitive biases at varying levels (Barber & Odean, 2001; Mishra & Metilda, 2015).

Research into entrepreneurs' investment decisions has found that a significant disparity exists between the amount of funding that male and female entrepreneurs receive (Edelman et al., 2018; Poczter & Shapsis, 2017). Every year, entrepreneurs receive over \$100 billion in venture capital funding (Brush et al., 2018). Female-founded ventures request approximately 40% of this funding, yet male entrepreneurs receive 97% of this funding (Brush et al., 2018; Global Entrepreneurship Monitor, 2016). This finding shows that even when factors such as funding amount and industry are controlled for, investors show a significant preference for male-led ventures (Brush et al., 2018; Global Entrepreneurship Monitor, 2016). This is further supported by studies that keep all else equal and find that investors prefer male entrepreneurs' funding

itches to those of female entrepreneurs (Brooks et al., 2014). Research has suggested that male versus female investment decisions are not the result of active or conscious decisions but rather investors' subconscious decisions based on the roles with which they associate the entrepreneur (Brooks et al., 2014; Kanze et al., 2018). Traditional models of gender roles are created on the notion of power and role congruency – the overlap between gender roles and the behaviors needed to successfully perform tasks (Eagly & Karau, 2002; Mazei et al., 2019). Although these roles have progressed over time through social movements, gender stereotypes still remain active (Bandura, 1986). Eagly and Karau (2002) argue that men and women are pre-stereotyped into roles and this causes entry barriers to certain roles based on gender. For instance, nursing is viewed as a feminine role while doctors are considered masculine. Entrepreneurship is typically considered a male-dominated role (Jennings & Brush, 2013; Malmström et al., 2017). Due to the role incongruence associated with female entrepreneurs, investors may perceive endeavors led by male entrepreneurs to be stronger investment choices than those led by female entrepreneurs.

Female entrepreneurs are not unaware of this disparity. The mismatch between feminine roles and the perceived role of entrepreneurs results in less economic success (Mazei et al., 2019). Women are typically considered to be more communal and less assertive in nature and can therefore be susceptible to backlash if they contradict this stereotyped behavior (Guadagno & Cialdini, 2007; Mazei et al., 2019). To counter the effect of role stereotypes and seek to increase their rewards, female entrepreneurs can attempt to mimic the characteristics of male entrepreneurs. By mimicking these characteristics, female entrepreneurs can create a similarity between themselves and the male entrepreneurs who are considered successful.

Since entrepreneurs are typically considered male (Malmström et al., 2017) and may display cognitive biases, due to the potential benefits that displaying such biases can bring to the role of

an entrepreneur, it follows that female entrepreneurs who display cognitive biases during their pitches impress upon investors the value of their products and services (Nagy et al., 2012) by creating a similarity between themselves and a successful male entrepreneur, whose characteristics they mimic. By displaying cognitive biases, female entrepreneurs demonstrate their knowledge, commitment, and confidence to investors and align themselves more closely with the masculine role of an entrepreneur.

2.4.2 Gender Differences in Overconfidence

In leadership positions and competitive environments, men tend to demonstrate more overconfidence than women (Anderson et al., 2012; Barber & Odean, 2001; Reuben et al., 2012). As such, men are often viewed as stronger leaders and are expected to be more assertive than women. However, while females are less likely to demonstrate overconfidence (Kirkwood, 2009; Mishra & Metilda, 2015), they may still benefit from displaying the bias (Beckmann & Menkhoff, 2008). The display of overconfidence can suggest bold entrepreneurial action and expert knowledge and can therefore be present in both male and female entrepreneurs.

Owing to gender role expectations, men are expected to demonstrate overconfidence, especially when they attempt to fit the role of the successful entrepreneur. Thus, it is possible that the potential benefits of being an overconfident entrepreneur already factor into investors' analyses of entrepreneurial ventures. However, female entrepreneurs who demonstrate overconfidence do not conform to the gender role expectations that align with being a female entrepreneur. Instead, this display of overconfidence creates a similarity between themselves and successful male entrepreneurs, elevating their status and potential worth for investors. Therefore, female entrepreneurs who demonstrate overconfidence may be viewed as stronger entrepreneurs

than their male counterparts and ultimately result in them receiving a greater reward for their display of cognitive bias from investors. We hypothesize the following.

Hypotheses 2a: Female entrepreneurs who display overconfidence in their pitches will receive more funding than male entrepreneurs who display overconfidence in their pitches.

2.4.3 Gender Differences in Illusion of Control

Often researched in conjunction with individual risk propensity, IoC is shown to have gender differences (Byrnes et al., 1999). Men are more likely to demonstrate IoC since women tend to be more risk-averse (Beckmann & Menkhoff, 2008; Jianakoplos & Bernasek, 1998). However, both male and female entrepreneurs are known to display IoCs (Mahadea, 2001) as they assume high levels of risk when introducing nascent ventures to markets. By displaying this bias, the entrepreneur might be lowering the investment's level of perceived risk by suggesting their ability to control the future of their product or service.

When entrepreneurs display IoC, they may be lowering perceived risks by alluding to their ability to control the future of their product or service, or to their ability to control the unknown. IoC is more likely to be exhibited by men because males are perceived to have a higher risk tolerance (Beckmann & Menkhoff, 2008) and are thus more likely to be expected to display this bias. However, since women tend to be perceived as having a lower risk tolerance (Jianakoplos & Bernasek, 1998), when female entrepreneurs display IoC they may be seen as more genuine and trustworthy in their belief in the future of their ventures.

By displaying IoC they are walking the line between appearing risky and contradicting their role expectation. Female leaders are perceived as needing to align with the role of women, suggesting that if they do not demonstrate warmth and compassion, they may appear unlikable

and offensive (Guadagno & Cialdini, 2007; Mazei et al., 2019). By displaying IoC, female entrepreneurs are suggesting skills and abilities that challenge this expectation, balancing their role as a female with the role of the entrepreneur. This clash of expectations and behavior helps female entrepreneurs stand out to investors and enables them to be considered as having the potential to succeed in the role of the entrepreneur. Since these biases are expected to be displayed by their male counterparts, female entrepreneurs may be advantageously rewarded by investors for not conforming to expected behaviors and demonstrating their worth to investors. We, therefore, posit the following.

***Hypothesis 2b:** Female entrepreneurs who display an illusion of control in their pitches will receive more funding than male entrepreneurs who show an illusion of control in their pitches.*

2.4.4 Gender Differences in Generalizing from Small Numbers

There are significant differences in the amount of reliance that men and women put on their ability to generalize from their experiences (Schaumberg & Flynn, 2017). Since self-reliance is more closely aligned with the masculine role, men are more likely to display it (Eagly & Karau, 2002; Schaumberg & Flynn, 2017). This indicates that male entrepreneurs might be expected to generalize from small numbers in their pitch to investors. Yet, in addition to demonstrating self-reliance, the ability to GSN is also valued in entrepreneurs as it suggests an ability to create novel opportunities (Busenitz & Barney, 1997).

GSN demonstrates the self-reliance individuals have in their prediction methods, by relying on their own experiences and backgrounds to support such generalizations. However, while male it may be anticipated and accepted in male entrepreneurial pitches, it conflicts with the gender

schema of female entrepreneurs (Bussey & Bandura, 1999), as female entrepreneurs are viewed as more communal and less self-reliant. Yet, in some instances, women may be evaluated as better self-reliant leaders than men (Schaumberg & Flynn, 2017). By demonstrating the ability to GSN, female entrepreneurs show their perseverance and passion for their ventures, their commitment, and their self-drive and determination to succeed. We, therefore, suggest that female entrepreneurs who GSN will be better rewarded than their male counterparts.

***Hypothesis 2c:** Female entrepreneurs who generalize from small numbers in their pitches will receive more funding than male entrepreneurs who generalize from small numbers in their pitches.*

2.5 Method: Overview of Studies

We used a mixed-method approach with content analysis and experiments to test the hypotheses. Study 1 used transcripts of entrepreneurial pitches presented on ABC's *Shark Tank* between 2014 and 2018. We conducted a content analysis of the pitch transcripts to observe the pitching entrepreneurs' displayed cognitive biases and the association between the display of each cognitive bias and the tested funding outcomes. The real-world snapshots of the pitch processes provided us with an insight into what is usually a private exchange between investors and entrepreneurs.

Study 2 adopted an experimental design approach to collect data from two samples. The experimental design allowed for specific manipulations of biases and gender while holding all other factors constant, which allowed us to enhance Study 1's generalizability. Both studies

allowed us to gain significant insights into how entrepreneurs' displays of cognitive biases in pitches influence funding outcomes and why the gender gap in funding exists.

2.5.1 Study 1: A Field Study Using Content Analysis

2.5.1.1 Setting

ABC's *Shark Tank* is a nationally televised show where entrepreneurs pitch their companies to a group of investors ("Sharks") to receive a deal (equity in exchange for funding) from the "Sharks." These pitches provided us with an insight into a typically private negotiation process and a substantial female population from which to collect data. Each pitch is curated for airtime by the network, edited for dramatic effect, and selected based on television ratings potential (B. Smith & Viceisza, 2018). Because each pitch is unscripted and for real companies with real money, the show maintains the integrity of the process. Similarly to most professional funding opportunities, the "Sharks" invest their own money and have no obligation to invest (Poczter & Shapsis, 2017). For this study, we transcribed each episode using Descript's transcription services and isolated the entrepreneurs' speaking parts for analysis. Additional data was collected from the show and supplemented by data gathered by Halle Tecco (Tecco, 2018).

2.5.1.2 Sample

We examined 256 pitches (127 male pitches and 129 female pitches) between Seasons 5 and 9 of *Shark Tank*. We began our data collection process at Season 5 because this season was the first to establish the format for the remaining seasons and concluded the process at Season 9 because this season was the most recently aired at the time of data collection. The participants were either single entrepreneurs or single-gender teams. The dataset comprised all available

female entrepreneur and female entrepreneurial team pitches and a random sampling of male entrepreneur and male entrepreneurial team pitches. Based on this sample, 53% of the male entrepreneurs received a deal, while 61% of the female entrepreneurs received a deal. Combined, the average asking valuation of the pitches was approximately \$3.3 million with an initial equity offer of 14%. Of the pitches that resulted in a deal, the average valuation was \$2.2 million, with the “Sharks” investing for 25% of the equity.

2.5.1.3 Measures

2.5.1.3.1 Independent Variables

Gender was measured using a dummy variable for male and female entrepreneurs (female = 1; male = 0).

Overconfidence and *Illusion of Control* were measured using a content analysis approach, which has become a popular method to capture the cognition of individuals and leaders (e.g., (Gamache et al., 2015; Graf-Vlachy et al., 2020). First, we used a thesaurus approach and developed two dictionaries of words that when used in a sentence may indicate overconfidence, such as “unique,” “revolutionary,” “best,” and IoC such as “will,” “know,” “guarantee”. We validated the dictionaries with five doctoral students in business fields, who were unrelated to our study. We provided the students with the definition of the biases and the list of potential dictionary words, and for each word, the students indicated whether they believed that someone who had used the word would most likely be overconfident. As part of our sorting method, we retained the words that had an agreement score of at least 80% among the students. We ultimately ended up with 2 dictionaries (see Appendix A.1: Overconfidence Dictionary and

Appendix A.2: Illusion of Control Dictionary) that had 44 and 30 words each, respectively². Lastly, we used Linguistic Inquiry and Word Count (LIWC, 2015) to analyze each pitch and obtain the percentage of the words spoken in each pitch. Any pitch whose use of this language was above the median response was considered to display the bias and coded as a binary variable. This process removed any pitches where language could have been used to represent a person who was confident rather than overconfident or demonstrating knowledge in a subject area. This threshold maintained a conservative sample for analysis since these biases are associated with entrepreneurs and should therefore appear in more than half of their pitches.

GSN was measured by analyzing the entrepreneurs' founding story from their pitches. Based on the definition of the bias, entrepreneurs were considered to have exhibited this bias when they based the founding decisions of their companies on a few observations as opposed to basing their companies on single instances or big data (not biased) (Busenitz & Barney, 1997; Tversky & Kahneman, 1971). Examples include an entrepreneur who noticed multiple kids shopping for prom attire that they would only use once and decided to make multi-use prom clothing (biased), compared to an entrepreneur who grew up with a love of flowers and decided to create a flower company (non-biased). This was coded as a binary variable (Yes = 1, No = 0).

2.5.1.3.2 Dependent Variables

The dependent variable in this study was the amount of funding that an entrepreneur or entrepreneurial team received. We collected data on the funding amount using the pitch transcripts. We used the log of the final deal valuations to account for the variability of this

² The words used in these dictionaries were further validated in Study 2 to be reflective of the entrepreneur being either overconfident or having an illusion of control

value. Pitches that did not receive a deal were set at a value of 0.

2.5.1.3.3 Control Variables

We utilized several controls to account for the characteristics of the pitches, the entrepreneurs, their companies, and the industry effects (Poczter & Shapsis, 2017; B. Smith & Viceisza, 2018). Each season of *Shark Tank* is shot in 15 to 17 days over the summer and fall and is subsequently edited and aired between fall and spring (B. Smith & Viceisza, 2018). To account for any factors that could have differed owing to changes in time, seasonality, or episode length, we controlled for the season using a clustered variable and the word count of the pitch. To account for any bias toward a particular area, we controlled for the industry of each pitch. Each pitch was categorized as either “Fashion/Beauty”, “Children/Education”, “Lifestyle/Home/Media”, “Food/Beverage”, “Health/Wellness/Fitness/Sports”, “Software”, “Tech”, or “Uncertain/Other” with an average of 29 pitches per category. We controlled for the initial asking valuation, initial asking equity value, the change in equity if a deal was made, and prior sales to account for deal quality, prior performance, company value, and entrepreneurial experience.

2.5.1.4 Analysis

To analyze how an entrepreneur’s display of cognitive biases affected funding, we tested these hypotheses using a generalized linear regression in *R*. As a robustness check, owing to 40% of our dependent variables having a value of 0, we reran the data using a Tobit regression in STATA and found consistent results. The results are summarized in Tables 1, 2, and 3.

Table 1: Effects of Biases on Entrepreneurial Funding Using Shark Tank Data (Study 1)

Variable	Effects of Bias on Entrepreneurial Funding		
	Estimate	Std error	Z value
Overconfidence	0.36**	0.18	1.98
Illusion of Control	0.01	0.07	0.19
Generalizing from Small Numbers	0.37	0.25	1.48
Change in Equity	13.64****	2.03	6.72
Amount of Equity requested	3.51	2.90	1.21
Log of Prior Sales	0.10	0.05	1.92
Log of Amount of Funding requested	0.68****	0.18	3.69
Industry (Fashion/ Beauty)	-0.72	0.54	-1.33
Industry (Food/Beverage)	-0.51	0.53	-0.96
Industry (Health/Wellness/Fitness/Sports)	-0.14	0.20	-0.72
Industry (Lifestyle/Home/Media)	-0.69****	0.15	-4.58
Industry (Software)	0.31	0.69	0.44
Industry (Tech)	-0.55**	0.22	-0.91
Industry (Uncertain/Other)	-0.29	0.32	-0.92
Percent of female investors	0.09	0.79	0.11
Word Count	0.00	0.00	0.27
Intercept	-1.26	1.01	-1.25

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 2: Effects of Gender and the Display of Biases on Entrepreneurial Funding Using Shark Tank Data (Study 1)

Variable	Overconfidence			Illusion of Control			Generalizing from Small Numbers		
	Estimate	Std error	Z value	Estimate	Std error	Z value	Estimate	Std error	Z value
Overconfidence	0.71****	0.13	-5.42	-	-	-	-	-	-
Illusion of Control	-	-	-	0.59**	0.27	-2.17	-	-	-
Generalizing From Small Numbers	-	-	-	-	-	-	0.81***	0.29	-2.72
Change in Equity	18.20****	0.91	19.99	17.40****	0.82	21.11	13.08****	3.51	3.73
Amount of Equity requested	6.31**	2.34	2.70	7.39****	2.08	3.54	-1.43	5.64	-0.25
Log of Prior Sales	-0.06	0.09	-0.61	0.09**	0.05	1.96	0.09	0.13	0.70
Log of Amount of Funding Requested	1.35****	0.37	3.61	0.83	0.52	1.59	0.67	0.67	0.99
Industry (Fashion/ Beauty)	0.02	0.72	0.02	-1.27**	0.55	-2.27	-0.03	0.51	-0.05
Industry (Food/Beverage)	-0.11	0.66	-0.17	-0.76	1.15	-0.66	-0.67****	0.19	-3.46
Industry (Health/Wellness/Fitness/Sports)	-0.25	0.29	-0.85	-1.38**	0.52	-2.65	0.64	0.61	1.05
Industry (Lifestyle/Home/Media)	-0.57	0.49	-1.14	-0.95	1.01	-0.94	0.03	0.40	0.08
Industry (Software)	0.07	1.06	0.06	-0.16	0.85	-0.19	0.88	0.93	0.95
Industry (Tech)	-0.21	0.61	-0.34	-0.12	0.57	-0.20	-	-	-
Industry (Uncertain/Other)	-1.40****	0.26	-5.30	-0.31	0.73	-0.42	0.13	0.34	0.38
Percent of female investors	-0.11	1.22	-0.08	0.50	2.26	0.22	-1.51	3.39	-0.45
Word Count	0.00	0.00	1.57	0.00	0.00	0.83	0.00	0.00	-0.38
Intercept	-4.82	2.62	-1.84	-1.97	2.64	-0.75	0.92	4.61	0.19

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 3: Means, Standard Deviations, and Correlations of Independent and Dependent Variables Using Shark Tank Data

(Study 1)

Variable	Mean	Std. dev.	1	2	3	4
1 Entrepreneur Gender (F = 0, M = 1)	0.50	0.50				
2 Overconfidence (Biased = 1, Unbiased = 0)	0.50	0.50	-0.07			
3 Illusion of Control (Biased = 1, Unbiased = 0)	0.50	0.50	0.02	0.18**		
4 Generalizing from Small Numbers (Biased = 1, Unbiased = 0)	0.51	0.50	-0.01	0.01	-0.06	
5 Log of final deal valuation	3.61	2.96	-0.12	-0.01	-0.11	0.14**

Note: *** $p < 0.001$, ** $p < .01$, * $p < .05$, $p < 0.1$

Hypotheses 1a, 1b, and 1c stated that entrepreneurs who exhibit overconfidence, IoC, or GSN, respectively, during their pitches will receive more funding than those who do not. The regression analysis shows support for H1a ($b = 0.36, p < 0.05$), indicating that entrepreneurs exhibiting overconfidence had a positive effect on the amount of funding. Using a Robustness of Inference to Replacement (RIR) test to analyze the causal inferences, we found that 2% of the data would need to be due to an omitted variable to invalidate the findings (Busenbark et al., 2022). However, based to the significant p-value, the nature of the data set, and the correlation between entrepreneurs and overconfidence (Busenitz & Barney, 1997), we feel confident in this finding. The data did not find support for H1b or H1c, suggesting that IoC and GSN did not have significant effects on the amount of funding entrepreneurs receive.

Hypothesis 2 stated that female entrepreneurs who display a cognitive bias during their pitches will receive more funding than male entrepreneurs who display a bias. The data supported H2a ($b = 0.71, p < 0.001$), suggesting that female entrepreneurs who demonstrate overconfidence receive significantly more funding than male entrepreneurs who demonstrate overconfidence. An analysis of the difference in funding supported H2b ($b = 0.59, p < 0.05$), indicating that female entrepreneurs who displayed an IoC received more funding than male entrepreneurs who exhibited this bias. An RIR test found that 64% and 9% of the data, respectively, would have to be due to an omitted variable to invalidate these findings. Additionally, there is a significant difference in funding between male and female entrepreneurs who GSN. The data supports H2c ($b = 0.81, p < 0.01$), suggesting that investors give more funding to female entrepreneurs who display GSN compared to male entrepreneurs who display the same bias.

2.5.1.5 Discussion

The findings of this study show an investment preference for female entrepreneurs who display cognitive biases. Female entrepreneurs who displayed overconfidence received more funding compared to females who did not. However, exhibiting overconfidence may have a negative effect on male entrepreneurs, as male entrepreneurs who showed overconfidence received less funding than those who did not. Additionally, female entrepreneurs who displayed any cognitive bias tended to receive more funding than male entrepreneurs who displayed the same bias. Overall, these results suggest that experienced investors, such as the “Sharks”, value the attributes suggested through the display of cognitive biases and hold entrepreneurs who display such biases in a higher regard.

2.5.2 Study 2: Experimental Design

To enhance the generalizability of our findings, we conducted a vignette-style online experiment to mimic the entrepreneur–investor pitch process. The experiment was administered using a sample of participants with broad demographics from Amazon’s Mechanical Turk Platform (MTurk). Data was collected consistent with best practices (Cobanoglu et al., 2021; Young & Young, 2019). In this experiment, the participants simulated the role of investors and were provided funds for the role. This study determined whether and to what extent cognitive biases exhibited by entrepreneurs affected the entrepreneurs’ funding amount and how this was moderated by the entrepreneurs’ gender. The experiment isolated the effects of the bias and the gender of the entrepreneurs to determine their relationship with the funding amount while keeping all other factors equal. By using a broader sample of investors and isolating the effects

of the bias and the gender of the entrepreneurs, the experimental study increased the generalizability of our findings from the *Shark Tank* data.

2.5.2.1 Recruitment

We recruited 661 participants through Amazon's platform. Based on best practices, we limited recruitment to those aged 18 years or over who resided in the United States (Cobanoglu et al., 2021; Young & Young, 2019). Additionally, participants needed to have a Human Intelligence Task Rate (HIT Rate) acceptance greater than 95% to participate in the study. The study took 10 to 20 minutes to complete. Our sample included 276 male participants, 316 female participants, and two participants who self-identified as "other." The average age of the participants was 35 years. After disqualifying any subjects that failed attention checks, we were left with 594 participant responses to use in our analysis.

2.5.2.2 Procedure

In the experiment, participants played the role of investors and were asked to view a series of paired pitches. All pitches introduced the same product, and participants had to decide whom to invest in and the amount to invest. For the purpose of examining differences based on the gender of the entrepreneurs, half of the participants compared pairs of all male pitches, while the other half compared pairs of all female pitches. For each pair, participants were required to select one of the pitches in which to invest and the amount of investment. We provided all investors with sufficient funds to fully invest in one of the pitches in each set of paired pitches. All pitches asked for \$100,000, had no previous sales, and offered 5% equity for investment.

Following each pair of pitches, participants were asked questions regarding their investment decision before moving on to the next pair of pitches. After all investment decisions had been

made, participants were asked questions regarding their risk preferences and demographics. At the end of the experiment, we notified the participants of how much they had earned through the experiment and paid them their earnings upon their completion of the experiment.

2.5.2.3 Measures

2.5.2.3.1 Independent Variables

Along with the entrepreneur's *Gender*, there were three cognitive-bias-related independent variables: *Overconfidence*, *Illusion of Control*, and *Generalizing from Small Numbers*. We used the measures in Study 1 to construct the vignettes shown to participants, creating both biased and nonbiased pitches for each cognitive bias. Words from the validated dictionary in the entrepreneurs' pitches were used to demonstrate their display of *Overconfidence* and *IoC*. The entrepreneurs' founding stories were included in the vignette to display *GSN*. Each of these variables was coded as a binary variable to indicate whether the vignette represented a biased or nonbiased pitch or whether the entrepreneur was male or female.

2.5.2.3.2 Dependent Variable

Based on the participants' responses, we collected data on the amount of money invested. For each set of paired pitches, participants were asked how much they were willing to invest and were informed that they had been given enough funds to invest completely in one of the pitches.

2.5.2.3.3 Control Variables

To control for deal quality, all financial data and objective pitch information were kept the same, including the requested investment amount, the amount of equity offered, and the amount of prior sales. The study controlled for the race and ethnicity of entrepreneurs by only using

typical Caucasian names, such as Bob and Sue. After the participants were asked questions about the pitches, they were asked questions about their backgrounds and risk preferences. The questions related to risk aptitudes, ages, genders, ethnicities, levels of education, number of business classes, familiarity with *Shark Tank*, whether the participants believed that the gender of the entrepreneurs affected participant responses, and whether the participants self-identified as entrepreneurs.

2.5.2.4 Manipulation

2.5.2.4.1 Gender Manipulation

Gender effects were tested using a between-subject design. Participants were randomly assigned into two groups. The only difference between these groups was that one group viewed pitches with typical male names, such as Bob or Bill, while the other group viewed pitches with typical female names, such as Mary or Sue. We isolated the gender effects by only changing the entrepreneurs' names and keeping everything else equal. The results showed significant differences in the amount of funding that entrepreneurs received based on their gender.

2.5.2.4.2 Cognitive Bias Manipulation

The cognitive bias manipulation was tested using a within-subject design. Participants were shown three sets of paired pitches with one pitch using words indicative of a cognitive bias such as IoC and the other not. For overconfidence and IoC, the words used to indicate a bias were based on validated dictionaries of words, the same set of words that were used in Study 1. We inserted a select few into each "biased" pitch to illustrate the biases. For GSN, one pitch shared a founding story that displayed GSN and one that did not.

As a manipulation check, following each investment decision, we asked the participants questions to determine whether they recognized the difference between the biased and unbiased entrepreneurs and whether they could recognize the desired bias in the pitch. The results indicated that the curated pitches reflected the desired bias.

2.5.2.5 Analysis

We used a generalized linear regression model to test our hypotheses on the effects of cognitive biases. We conducted the analysis using only the participants who self-identified as entrepreneurs. The results are summarized in Tables 4, 5, and 6 and discussed below.

Table 4: Effects of Biases on Entrepreneurial Funding Using Experimental Data (Study 2)

Variable	Overconfidence			Illusion of Control			Generalizing from Small Numbers		
	Estimate	Std error	Z value	Estimate	Std error	Z value	Estimate	Std error	Z value
Overconfidence	0.12****	0.01	0.02	-	-	-	-	-	-
Illusion of Control	-	-	-	0.07****	0.01	11.28	-	-	-
Generalizing From Small Numbers	-	-	-	-	-	-	0.003	0.02	0.15
Risk	0.00****	0.00	4.22	0.00****	0.00	3.89	0.00****	0.00	7.68
Age	-0.01	0.00	1.95	-0.00***	0.00	-3.76	-0.01***	0.00	2.98
Investor Gender (Male)	0.01	0.02	0.81	0.02	0.01	3.35	0.08	0.05	1.39
Investor Gender (Other)	-0.13	0.08	-1.55	0.05	0.01	4.74	-0.02	0.04	-0.70
Race (White)	0.15	0.11	1.41	0.03	0.01	6.55	0.11**	0.05	2.05
English Foreign Language (Yes)	0.08***	0.04	2.13	-0.05	0.01	-6.21	0.11	0.06	1.84
Number of Business Classes	0.00	0.00	0.41	-0.00	0.00	-0.42	0.00	0.00	1.19
Entrepreneur Gender (Male)	-0.00	0.06	-0.12	-0.05	0.06	-0.79	-0.02	0.03	-0.68
Intercept	4.53****	0.02	226.05	4.73	0.04	130.45	4.65	0.14	33.69

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 5: Effects of Gender and the Display of Biases on Entrepreneurial Funding Using Experimental Data (Study 2)

Variable	Overconfidence			Illusion of Control			Generalizing from Small Numbers		
	Estimate	Std error	Z value	Estimate	Std error	Z value	Estimate	Std error	Z value
Overconfidence	-0.02	0.05	0.46	-	-	-	-	-	-
Illusion of Control	-	-	-	0.06*	0.04	1.69	-	-	-
Generalizing from Small Numbers	-	-	-	-	-	-	0.06*	0.09	1.67
Risk	0.00	0.0	1.12	0.00****	0.00	11.44	0.00****	0.00	129.28
Age	-0.00	0.00	-3.19	-0.00	0.00	-0.44	-0.01	0.00	-2.62
Investor Gender (Male)	-0.02	0.05	-0.52	0.01	0.01	3.35	0.13	0.13	1.04
Investor Gender (Other)	0.02	0.02	1.28	0.16	0.05	3.19	-	-	-
Race (White)	-0.00	0.04	-0.05	0.01	0.06	0.19	0.16	0.01	1.74
English Foreign Language (Yes)	-0.07	0.03	-1.96	-0.09****	0.03	-2.69	0.02	0.06	2.91
Number of Business Classes	0.00	0.00	1.59	-0.00	0.00	-2.97	-0.00	0.00	-0.32
Intercept	4.79	0.00	756.84	4.80	0.15	32.84	4.58	0.17	26.30

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 6: Means, Standard Deviations, and Correlations of Independent and Dependent Variables Using Experimental Data

(Study 2)

Variable	Mean	Std. dev	1	2	3	4	5	6
1 Entrepreneur Gender (F = 0, M = 1)	0.43	0.50						
2 Overconfidence (Biased = 1, Unbiased = 0)	0.53	0.50	-0.08					
3 Illusion of Control (Biased = 1, Unbiased = 0)	0.55	0.50	0.04	0.13*				
4 Generalizing from Small Numbers (Biased =1, Unbiased =0)	0.65	0.48	-0.07	-0.11*	-0.08			
5 Log of overconfident deal funding	4.70	0.49	0.01	0.06	0.00	0.06		
6 Log of illusion of control deal funding	4.69	0.41	-0.02	0.06	0.05	0.05	0.76****	
7 Log of Generalizing from Small Numbers deal funding	4.69	0.49	-0.03	0.04	-0.02	0.10*	0.82****	0.76****

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Hypotheses 1 posited that entrepreneurs who exhibited a bias received more funding than those who did not. The experimental data shows support for H1a ($b = 0.12, p < 0.001$), suggesting that entrepreneurs who exhibit overconfidence receive more funding than those who do not. This is the same result found in the *Shark Tank* sample. The data shows support for H1b ($b = 0.07, p < 0.001$), suggesting that entrepreneurs who show an IoC receive more funding than those who do not. We conducted an RIR and found that 86% and 72% of the findings would need to be due to omitted variables to invalidate these results. The results do not support Hypothesis 1c but do suggest a positive correlation between entrepreneur GSN and increased investor funding.

Hypothesis 2a posited that female entrepreneurs who exhibit overconfidence will receive more funding than male entrepreneurs who exhibit overconfidence. Our data did not suggest a significant difference in the amount of funding male and female entrepreneurs received. In Hypothesis 2b, we posited that female entrepreneurs who showed IOC would receive more funding than male entrepreneurs who showed IoC. We found marginal support for H2b ($b = 0.06, p < 0.1$). Lastly, we hypothesized and found marginal support for H2c ($b = 0.06, p < 0.1$), suggesting that female entrepreneurs who exhibit GSN will receive more funding than male entrepreneurs. Additionally, an RIR test showed that 24% and 66% of the data would need to be due to an omitted variable to invalidate these findings.

2.5.2.6 Discussion

The experimental sample suggests that investors give more funding to entrepreneurs who display overconfidence and IoC. However, GSN only increased the amount of funding for female entrepreneurs. The study found that investors may expect male entrepreneurs to display a certain level of each bias and reward them if they do; however, if they demonstrate too much,

they are pushing themselves above an acceptable threshold that can be misconstrued as arrogant or disingenuous. On the other hand, to be considered strong entrepreneurs, females must demonstrate each bias in their pitches to appear to be passionate and dedicated. This result differs from that of Study 1, and this difference in result could be due to the contextual differences between the studies. Study 1 provided additional indicators of the gender of the entrepreneurs through the in-person pitch process, which made the gender of the entrepreneurs more noticeable to investors and increased the difference in results between genders.

2.5.3 Ad Hoc Analysis

In addition to examining how entrepreneurs' displays of cognitive biases affected their funding, we analyzed the data to determine whether the display of cognitive biases had an equal effect across both genders: male and female (See Table 7).

Table 7: Ad Hoc Analysis: Effects of bias within gender on entrepreneurial funding

		Male Entrepreneurs			Female Entrepreneurs		
Data Source	Variable	Estimate	Std error	Z value	Estimate	Std error	Z value
Study 1	Overconfidence	-0.12	0.18	-0.68	0.51*	0.31	1.69
	Illusion of Control	-0.31***	0.11	-2.93	0.33	0.36	0.91
	Generalizing from Small Numbers	0.43	0.37	1.17	0.09	0.45	0.19
Study 2	Overconfidence	0.18****	0.04	4.66	0.09***	0.03	3.22
	Illusion of Control	0.09***	0.03	2.62	0.08*	0.01	13.92
	Generalizing from Small Numbers	-0.02	0.04	-0.64	0.07****	0.01	11.30

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

In Study 1, we found that when examining male entrepreneurs, male entrepreneurs who

display of an illusion of control receive significantly less funding than male entrepreneurs that did not ($b = -0.31, p < 0.01$). Furthermore, when we examine the results of the female entrepreneurs, we find that female entrepreneurs who display overconfidence receive significantly more funding than female entrepreneurs that do not ($b = 0.51, p < 0.1$). These findings suggest displaying overconfidence and an IoC during an entrepreneur's pitch can significantly impact the amount of funding the entrepreneur receives.

Similarly, in the experimental sample, the data suggests that male entrepreneurs who display overconfidence or an IoC receive significantly more funding than male entrepreneurs that did not ($b = 0.18, p < 0.001$ and $b = 0.09, p < 0.01$ respectively). Additionally, the experimental data found that female entrepreneurs who displayed any bias received significantly more funding than female entrepreneurs who did not (Overconfidence: $b = 0.09, p < 0.01$, IoC: $b = 0.08, p < 0.1$, GSN: ($b = 0.07, p < 0.001$). These findings suggest displaying cognitive biases during an entrepreneur's pitch can have a considerable impact on the amount of funding they receive.

Together, these findings suggest that investors may expect male entrepreneurs to demonstrate cognitive biases and that investors reward male entrepreneurs regardless of if they explicitly demonstrate the bias. Conversely, to be considered strong entrepreneurs, female entrepreneurs must display cognitive biases during their pitches to appear passionate and dedicated.

2.5.4 Overall Discussion

When analyzing the results of the two studies, we find that Overconfidence and Illusion of Control are seen to be beneficial to the amount of funding an entrepreneur receives, but that generalizing from small numbers has little impact. Through further analysis, we also find that the gender of the entrepreneur does, in fact, matter. Indeed, between the studies we see that female

entrepreneurs who exhibit a cognitive bias tend to receive greater funding than male entrepreneurs. These findings have significant implications for how we view the role of cognitive biases in entrepreneurial funding.

2.6 General Discussion

Entrepreneurs who display cognitive biases during their pitch are successfully able to increase the amount of funding they receive from investors. Moreover, we find that the display of these biases by women entrepreneurs leads to greater funding success than previously acknowledged. Our contributions from this study are threefold. First, we have shown that the display of cognitive biases, which is typically considered detrimental, benefits entrepreneurs. Second, we have shown that the effects of the display of cognitive biases are not equally applicable to male and female entrepreneurs, but rather that they have gendered effects that favor female entrepreneurs. Lastly, we have developed a novel method of using linguistic analysis to capture and analyze the presence of cognitive biases.

2.6.1 The Display of Cognitive Biases is Rewarded

Most studies have disregarded the potential benefits of cognitive biases because such biases are considered detrimental in business settings. However, a main finding of this study is that an entrepreneurs' unconscious display of cognitive biases tends to positively affect the amount of

funding they receive.³ This finding suggests that investors value and reward entrepreneurs who can demonstrate assertiveness and self-reliance through their unconscious display of cognitive biases and provide their motivation for creating their ventures by sharing their founding stories.

Cognitive biases allow entrepreneurs to use System 1 thinking to process information, make decisions, and act when they are faced with the unknowns of bringing new products and services to the market. Without cognitive biases, entrepreneurs may be disadvantaged when creating and growing their nascent ventures.

2.6.2 Gender Differences

This study supports the notion that investors reward male and female entrepreneurs' displays of cognitive biases differently. One surprising finding of this study is that female entrepreneurs are rewarded with more funding than their male counterparts when they displayed a cognitive bias. This is counterintuitive to traditional findings due to the funding disparity that favors male entrepreneurs.

Studies have found that female entrepreneurs face a significant disparity regarding entrepreneurial funding (Edelman et al., 2018; Poczter & Shapsis, 2017). This study challenges the rationale behind this disparity by offering a new rationale. Owing to the preconceived notions of gender roles and successful entrepreneurs, investors have predetermined opinions about male and female entrepreneurs' investment potential. By displaying cognitive biases, female

³ Based on the data from Study 2, we did an additional analysis using a dummy variable indicating whether an entrepreneur received a deal (deal = 1, no deal = 0). Our results showed that displaying a cognitive bias significantly increased the likelihood of entrepreneurs receiving a deal.

entrepreneurs dispel the negative preconceptions that investors have of them based on their female gender, such as a lack of commitment, too much compassion, or not enough competence. In doing so, female entrepreneurs place themselves on a level playing field with the entrepreneurs whom investors view as typically successful (i.e., male entrepreneurs), thereby allowing investors to evaluate female and male entrepreneurs equally. Studies have found that, with a greater likelihood of success and an increased return on investment for investors, female entrepreneurs can in fact be a smarter investment (Abouzahr et al., 2018a). Therefore, by dispelling the detrimental preconceptions associated with female entrepreneurs, female entrepreneurs can compete with male entrepreneurs for funding more equally and ultimately win.

Another suggestion might be that women who display cognitive biases are viewed as showing “grit”, which is defined as passion and perseverance for a long-term goal (Duckworth et al., 2007). Grit is linked to an individual’s chance of success and is positively associated with venture success (Mooradian et al., 2016; Mueller et al., 2017). The more grit a female entrepreneur shows, the more an investor may trust them to bring their venture to success.

2.6.3 Mimicking Cognitive Biases

Based on the findings of this study, it follows that displaying cognitive biases generally benefit entrepreneurs seeking funding, especially female entrepreneurs. While the display of this bias in this study is unconscious, it does not prevent entrepreneurs from mimicking the behavior and language of these biases when they pitch their ventures. By using similar language to indicate these cognitive biases, entrepreneurs can give the impression that they possess the cognitive bias and may therefore increase the amount of funding that they receive. This tactic

may be an especially useful for female entrepreneurs because it could allow them to position themselves as more favorable investment opportunities for investors.

2.6.4 Linguistic Approach to Cognitive Biases

One of our contributions is the creation of a novel method to measure the presence of cognitive biases through text. Historically cognitive biases have been measured retrospectively, through task-based lab exercises, or through self-identified questionnaires (Busenitz & Barney, 1997; Camarero & Lovallo, 1999; Simon et al., 2000). In this study, we created and validated a text-based approach to determining if and to what extent the cognitive biases were present. Using a snowball technique based on the synonym of the words, we developed two dictionaries to indicate the cognitive biases: overconfidence and illusion of control. To further establish the validity of these dictionaries, we used the dictionary words to craft stylized vignettes for our second study. In our experiment using these vignettes, we were able to validate that, when used in context, the language indicated to a third-party reader that the subject was displaying a cognitive bias. By utilizing the linguistic analysis approach, we can better understand and analyze the effects of cognitive biases in entrepreneurial business decisions.

2.6.5 Limitations and Avenues for Future Research

We used a mixed-method approach to overcome the limitations of each of the studies. Our first study has potential limitations owing to the data being gathered from the curated episodes of *Shark Tank*. To address these limitations and increase the generalizability of our findings, we

conducted an experimental study that isolated the effects of gender and cognitive biases. The results of both studies in combination strengthened the findings of this paper.

Research that might emerge from this study could incorporate other entrepreneurial characteristics, such as different races and ethnicities. Future research could also incorporate nonlinguistic factors into each bias measurement and analyze them (Clarke et al., 2019) to expand on how entrepreneurs display cognitive biases and increase their funding.

2.6.6 Conclusion

This study sheds light on what investors reward during pitches and shows that male and female entrepreneurs are not rewarded equally. In fact, female entrepreneurs who display cognitive biases are rewarded with more funding than their male counterparts, which suggests that, while the focus of the funding disparity has been on the funding amounts and investors' potential prejudices, these funding outcomes could be a symptom of another issue. Female entrepreneurs have been told to continue to exhibit behaviors consistent with their role as women. They have been told not to boast or be too controlling. However, this study shows that these behaviors are exactly the type of behaviors that they should be exhibiting. It is possible that the funding disparity did not originate from investors' views but rather that it could be the outcome of how society suggests that female entrepreneurs behave. Forcing female entrepreneurs to conform to societal norms can hinder their ability to successfully gain funding. Female entrepreneurs must fully embrace the role of the entrepreneur to increase their investor funding. Male entrepreneurs unconsciously display cognitive biases, thereby demonstrating the characteristics representative of successful entrepreneurs, while women must consciously work on demonstrating their knowledge, confidence, and control. By encouraging female

entrepreneurs to exhibit behaviors consistent with these cognitive biases, female entrepreneurs can appear valuable, indicate potential future success, and receive more investor funding.

3.0 Paper 2: Gritty Women: Entrepreneurial Grit and Funding Outcomes

Entrepreneurs exhibit grit when bringing their nascent ventures to market. Grit may demonstrate an entrepreneur's ability to persevere in spite of obstacles and a passion to ensure their venture's success. We propose the existence of a positive correlation between the grit demonstrated during an entrepreneur's pitch and the funding they receive. Additionally, we posit that this relationship is moderated by the entrepreneur's gender. We conducted a mixed-methods study using content analysis and an experimental approach to test our hypotheses. Our findings suggest that grit significantly impacts an entrepreneur's likelihood of receiving a deal.

3.1 Introduction

Grit has long been regarded as an indicator of success (Duckworth et al., 2007). Defined as passion and perseverance in relation to a long-term goal, grit can predict an individual's likelihood of success (Duckworth et al., 2007). From children competing in spelling bees to adults completing military training, grit has been demonstrated to be an individual behavioral characteristic that can more accurately predict an individual's success over talent (Bartone et al., 2013; Duckworth et al., 2007). In business settings, individuals who possess grit have a greater probability of achieving success in their careers, and among entrepreneurs, grit is positively correlated with success as well (Mooradian et al., 2016; Mueller et al., 2017). Grit helps explain how individuals who strive to achieve long-term goals harness passion and perseverance to help accomplish them by overcoming challenges.

However, while research has proven the benefits of grit in relation to success, less research has examined how grit impacts entrepreneurs seeking investor funding. Successfully founding a new venture is a challenging goal that requires raising money for funding. Entrepreneurs must find methods of navigating the tumultuous start-up phase and of financially sustaining themselves by raising funding. To bring their product or service to market, entrepreneurs often display grit to indicate that they can adapt and persevere through obstacles to achieve their goal (Duckworth, 2013), and receiving funding may be a milestone that indicates success. Grit has been demonstrated to embody attributes that are crucial to the entrepreneurial process (Mueller et al., 2017), such as the willingness to become an entrepreneur, innovativeness, and personal satisfaction with the role of the entrepreneur (Al Issa, 2020; Arco-Tirado et al., 2019; Mooradian et al., 2016). Prior studies have investigated how an entrepreneur's passion, along with other factors, influences investor funding (Cardon & Stevens, 2009; Murnieks et al., 2016); however, minimal information exists regarding how an entrepreneur's display of grit impacts the amount of funding they receive.

Moreover, not all entrepreneurs face identical hardships when pursuing entrepreneurial endeavors and seeking funding (Belz et al., 2022). A pervasive stereotype holds that men are better able to manage risky and uncertain situations compared to their female counterparts (Badura et al., 2018; Reuben et al., 2012) and that men are therefore more successful entrepreneurs (Malmström et al., 2017). These societal generalizations are rewarded by investors who tend to prefer male entrepreneurs over female entrepreneurs and who grant men a disproportionate amount of funding (Belz et al., 2022; Brooks et al., 2014). However, despite investors' preference for funding male entrepreneurs, there is currently less insight regarding

whether the information that investors use as signals of an individual's grit impacts both male and female entrepreneurs equally.

This paper seeks to understand how displaying grit impacts an entrepreneur's ability to receive funding. Using the construct of grit, we posit that grit is positively correlated with entrepreneurs' ability to fund their success, as it may indicate attributes associated with successful entrepreneurs. In addition, we posit that female entrepreneurs who exhibit higher levels of grit diminish the perceived risk of their ventures, thereby counteracting potential negative perceptions of female-led ventures and resulting in higher amounts of investor funding.

To test the hypotheses, we have adopted a mixed-methods research design using both content analysis and experiments. In study 1, data was gathered by analyzing transcripts from ABC's Shark Tank (Fuchs, 2014). In study 2, an experiment was conducted to isolate the effects of gender and grit in investors' decision processes and to enhance to the generalizability of the findings from study 1. This study contributes to the literature by providing insight into the attributes investors value when making funding decisions and how these decisions are impacted by grit and gender. Additionally, this study aims to provide insight into how female entrepreneurs can more effectively signal their strength as entrepreneurs to investors in the interest of minimizing the gender gap in funding.

The paper is structured in the following order. It opens with a discussion of entrepreneurial risk and grit, building to the hypotheses. It then explores the effects of gender and grit in pitches and examines their impact on funding. This is followed by an explanation of our methods, measures, and analysis. The paper concludes with a discussion of the findings and implications of this study.

3.2 Grit and Entrepreneurship

3.2.1 Introduction to Grit

Grit, a characteristic defined as “passion and perseverance for a long-term goal” (Duckworth et al., 2007), is exhibited by people in various settings. In alignment with other studies, we describe grit as a higher-order, malleable, and domain-specific behavioral construct (Datu, 2017; Jordan et al., 2018; Mueller et al., 2017). Grit encompasses two distinct components, namely passion (consistency of interests) and perseverance of effort (Credé et al., 2017). Some argue that these sub-constructs may have individual effects and should not be classified together; however, recent studies have shown that the combination of these two sub-constructs is necessary to indicate the likelihood of success (Salisu et al., 2020). Grit is frequently considered a significant factor in determining an individual’s probability of success (Credé et al., 2017) and a better determinate of success than raw talent (Duckworth, 2016). This may be because grit indicates not only an individual’s ability to succeed but also their determination and perseverance to continue striving towards their goals (Duckworth & Gross, 2014). Individuals with grit have been demonstrated to possess a driving force to persevere through onerous feats, adapt to challenges that arise, and continue persisting toward their goal; in the case of entrepreneurs, this is pivotal to build a successful venture (Reynolds and Curtin, 2008 as cited in Mueller et al., 2017).

The subconstruct passion, as it pertains to grit, is not defined in the traditional emotional manner but rather as the ability to remain focused and not be easily distracted (Mueller et al., 2017). The subconstruct perseverance is characterized by the motivation to achieve a long-term goal (Duckworth et al., 2007; Mueller et al., 2017). This definition of perseverance, as it relates

to grit, differs from similar constructs, such as tenacity and resilience, based on the motivation driving the actions. Perseverance refers to persisting with the aim of accomplishing a pre-determined goal that is not short-term or easy to accomplish but rather a difficult task that requires constant focus to succeed (Eskreis-Winkler et al., 2014).

3.2.2 When is Grit Relevant?

While some uncertainty exists regarding to what degree grit can predict success, grit is frequently correlated with success (Duckworth et al., 2007). The effects of grit may be moderated by the types of tasks necessary to achieve success or by the performance domain (Credé et al., 2017). More specifically, the level of grit necessary for success varies based on the context and domain of the tasks. Some believe that when tasks are difficult but clearly defined, higher levels of grit are the most useful in predicting success (Credé et al., 2017; Macnamara et al., 2014). Examples of this include cadets completing military training, high school students graduating, and academic competitions, such as spelling bees (Bartone et al., 2013; Duckworth et al., 2007). Conversely, when tasks are novel, ambiguous, or ill-defined, researchers regard grit as a less effective indicator of success, as the end goals are often less easily defined (Credé et al., 2017).

However, while researchers have debated the types of tasks that lend themselves to grit, in business settings, studies have demonstrated a strong correlation between grit and career success (Lechner et al., 2019). This indicates that grit helps individuals overcome barriers and obstacles even if they have an established goal but not a concrete path. This correlation between individual grit and career success is not limited to traditional businesses but also applies to nascent ventures and the entrepreneurs who create them (Salisu et al., 2020).

Entrepreneurs operate with high levels of uncertainty, as they create a product or service, often with an unknown customer market (McMullen & Shepherd, 2006). As such, they must frequently be creative in their methods to overcome obstacles when expanding their venture. Grit might be one of the reasons why some entrepreneurs persevere while others falter. This creativity is guided by the entrepreneur's passion and perseverance in relation to achieving their concrete goal of bringing the product or service to market. Studies have supported this idea by demonstrating a positive correlation between entrepreneurs who identify as gritty and the success of their ventures (Mooradian et al., 2016; Mueller et al., 2017). Entrepreneurs are driven by the ambiguity and unclear path of creating their venture to develop a concrete goal and work towards the success of that goal.

To bring their product or service to market, entrepreneurs whose ventures are in the nascent stage frequently seek funding by pitching their ventures to investors (Brooks et al., 2014). However, due to the novelty of the venture, investors are unable to rely on the historical product, market, or financial data. To compensate for this incomplete information, investors will supplement their decisions through the use of more subjective information, such as their intuition, "gut feel," (Huang & Pearce, 2015), and characteristics of the entrepreneurs themselves (Brooks et al., 2014; Cardon et al., 2017; Kanze et al., 2018; Matusik et al., 2008; Murnieks et al., 2016). This study extends this area of research to encompass an entrepreneur's display of grit as a reflection of characteristics that may be valued by investors to predict the potential success of the venture.

3.2.3 Grit and Entrepreneurship

Entrepreneurs differ from traditional business managers in several respects that coincide with the phenomenon of grit. Entrepreneurs and traditional business managers view risk differently (Busenitz & Barney, 1997). Operating under conditions of uncertainty, entrepreneurs face many issues that lie beyond their control. As such, entrepreneurs are often perceived as having a higher risk tolerance relative to traditional standards (Busenitz, 1999). While this may be the case, entrepreneurs tend to harbor a different perspective concerning risk which is considered irrational to some (Simon et al., 2000). This is because they must operate with incomplete information and must therefore evaluate decisions and take actions with more limited data. This results in the perception that they are riskier. Similarly, individuals who identify as gritty have been shown to have a higher willingness to take risks (Lucas et al., 2015). By drawing a parallel between the two, it follows that entrepreneurs may also be perceived as gritty due to their higher aptitude for risk-taking. Individuals with grit are more willing to pursue a risky endeavor, as they possess the motivation and determination necessary to become successful, a characteristic akin to an entrepreneur starting their venture.

Entrepreneurs create nascent ventures in spite of knowing that most ventures fail (Shepherd et al., 2000). Entrepreneurs view failure differently than non-entrepreneurs (Kuratko et al., 2020) and typically do not view failure as a permanent state (Duckworth, 2013); alternatively, they may not view an event as a failure at all. Bringing a new venture to the market entails many uncertainties and vicissitudes. For entrepreneurs to be successful, they must expect these setbacks and obstacles and be determined to persevere and overcome these challenges; otherwise, it can result in the failure of their new venture (Shepherd et al., 2000). This mindset makes entrepreneurs more likely to find methods to adapt and overcome the challenges they face

with the new ventures, as they know that the actions they pursue can change the trajectory of their venture (Kuratko et al., 2020). This desire to continue pushing their venture forward, overcoming obstacles and challenges in the process, may demonstrate an entrepreneur's grit.

Research suggests that an entrepreneur's internal motivation for success can be an indicator of their potential for success and the growth of the new venture (Baum & Locke, 2004). Their passion and perseverance, as defined by grit, provide an internal motivation for the entrepreneur to succeed (Morton & Paul, 2019). This supports entrepreneurs in persisting through setbacks, overcoming obstacles, and adapting to the ever-changing landscape that is involved in bringing a novel product or service to market. A unique and differentiating characteristic of grit is the necessity of working towards a long-term goal. Entrepreneurs who strive to create a nascent venture must understand that the journey to success is not brief or seamless; instead, it is a long and arduous process. By embracing the characteristics of grit, entrepreneurs motivate themselves towards their own long-term goal of making their nascent venture a success.

Additionally, individuals with grit have been known to remain on a path or course of action longer than is perceived as useful (Lucas et al., 2015). While this may be beneficial in some cases and detrimental in others, studies have found that this may be beneficial for entrepreneurs (Drummond, 2014; Staw, 1981). This is because the entrepreneur may be the only person who is able to fully understand the vision of their venture and drive the venture to market. By demonstrating grit, entrepreneurs can enter new markets, create new ventures based on novel ideas, and eventually garner the support of others. This perseverance to continue persisting, beyond the limit that is perceived as rational to some (Thaler et al., 2000; Tversky & Kahneman, 1974), can help entrepreneurs achieve success in bringing their ideas to fruition.

For these reasons, grit can be perceived as a benefit for an entrepreneur. If the entrepreneur can exhibit grit to investors, their grit may serve as an indicator of their drive to succeed and diminish the perceived risk of the investment. The signal of potential success, which results in a lower perceived risk in the venture, influences investors to fund entrepreneurs who exhibit grit, prompting Hypothesis 1.

Hypothesis 1 (H1): *Displaying higher levels of grit during a pitch increases the probability of the entrepreneur receiving investor funding.*

3.3 Grit and Gender

Male and female entrepreneurs exhibit varying levels of grit in similar circumstances (Christensen & Knezek, 2014), indicating that insights related to grit may not be equally applicable to both male and female individuals. However, women are at a disadvantage in terms of seeking funding, with only 3% of female-founded ventures receiving funding (GEM, 2018). Although we predicted that grit is positively correlated with the amount of funding an entrepreneur receives, we propose that this association is also dependent upon the entrepreneur's gender. While studies have found that women tend to exhibit higher levels of grit than men in general (Christensen & Knezek, 2014), little is known about how grit is manifested in entrepreneurial settings and the variations that may arise due to the entrepreneur's gender. Furthermore, less is known about how grit is rewarded by investors and about how these rewards differ based on the entrepreneur's gender.

Studies have shown that gender plays a significant role in funding decisions. For all of human history, male leadership has been dominant (Fine, 2017). When faced with uncertainty,

many view men as stronger leaders, and this socially perceived idea has permeated the field of entrepreneurship. Due to the inherent risk and uncertainty present in nascent start-ups, many presume that males are better entrepreneurs (Malmström et al., 2017); men have therefore received more investor funding than women (GEM, 2018; Jennings & Brush, 2013).

While these decisions may not evince a conscious bias against women, investors frequently exhibit a preference for men by asking different questions about the future of the venture (Kanze et al., 2018), basing decisions on the language the entrepreneurs use (Balachandra et al., 2019) and on how entrepreneurs present their ventures (Balachandra et al., 2019). Even when all the information presented is identical, investors display a proclivity to invest in male-founded ventures over female-founded ventures (Brooks et al., 2014). Collectively, investors indicate that while the gender bias against women may not be conscious, there are behavioral and cognitive aspects of females' entrepreneurial pitches that are detrimental to their ability to receive funding (Belz et al., 2022). To combat this gender bias, female entrepreneurs must find a means to express their value as an entrepreneur to the investor and increase the amount of funding they receive.

Entrepreneurs who demonstrate grit may exhibit valuable characteristics that can lead to a higher likelihood of the entrepreneur becoming successful. In light of the role congruency of being an entrepreneur, the stereotypical successful entrepreneur is assumed to be male (Jennings & Brush, 2013; Malmström et al., 2017). As such, these characteristics embodied by grit may be expected in male entrepreneurs; therefore, when outwardly exhibited to investors, they may be given less consideration. However, female entrepreneurs are not considered stereotypical entrepreneurs (Jennings & Brush, 2013; Malmström et al., 2017). To be viewed and valued as strong entrepreneurs, they must take additional steps to signal their merit to investors. By

demonstrating characteristics such as grit, they signal their ability to adapt and surmount challenges. This exhibition of their grit may be noticed more by investors, as it contradicts the preconceived gender schema associated with being a female entrepreneur (Bussey & Bandura, 1999; Malmström et al., 2017).

Female entrepreneurs may also diminish the perceived riskiness of the venture by exhibiting grit. Female entrepreneurs are often confronted with the belief that for various reasons, typically family obligations, they will not follow through or will stop being committed to the venture and to its growth and success (Jennings & Brush, 2013). Displaying grit directly contradicts this assumption, as it demonstrates their commitment and ability to persevere toward their long-term goal of venture growth and success. By exhibiting grit during their pitch, female entrepreneurs can negate perceived weaknesses attached to the role perceptions that accompany being a female entrepreneur. Women are often faced with the arduous task of straddling the line between demonstrating warmth and compassion consistent with preconceived role stereotypes associated with being female and demonstrating the necessary competence and skill to succeed (Fiske & Swencionis, 2015). By demonstrating grit, they exhibit characteristics that align them more closely with the expected role of the entrepreneur, namely the masculine role.

Because this combination of gender and behavior is not congruent with the expected role of the entrepreneur, the display of grit impacts female entrepreneurs more than male entrepreneurs due to the element of surprise. Male entrepreneurs may be expected or assumed to possess grit without demonstrating it during their pitch. Female entrepreneurs may need to explicitly demonstrate grit to counteract the negative gender association. Additionally, because female entrepreneurs exhibit behavior that contradicts their expected behavior, it may be more noticeable, thereby surprising investors and having a greater impact on their funding decisions.

By exhibiting grit in their pitches, female entrepreneurs may minimize the perceived riskiness of the venture, thereby elevating their appeal as an entrepreneur for investors and increasing their probability of receiving funding, prompting Hypothesis 2.

Hypothesis 2 (H2): *Displaying grit in a pitch has a greater positive impact on receiving funding for female entrepreneurs than for male entrepreneurs.*

3.4 Methodology and Sample

We used a mixed-methods approach in this study. Study 1 used archival pitch data collected from ABC's Shark Tank. Using content analysis and an adaptation of Duckworth's Grit Scale (Duckworth et al., 2007), we determined the level of grit the entrepreneur exhibited (if any) and recorded the funding outcomes of the entrepreneur's pitch. The real-world videos of the entrepreneur's pitch and investor reactions in terms of funding offered insight into what is normally a private exchange between investors and entrepreneurs.

Study 2 aimed to strengthen the findings of the archival study using an experiment. The experimental design enabled us to isolate and manipulate the effects of gender and grit while keeping all other factors constant. This allowed us to expand and enhance the generalizability of the findings from Study 1. Together, the studies provide significant insight into the gender funding gap and the moderating role of grit.

3.4.1 Study 1: Field Study Using Content Analysis

3.4.1.1 Setting

Data was collected from ABC's Shark Tank, a nationally televised show. The premise of the show is that entrepreneurs seek funding from investors (Sharks) by pitching their idea or company in hopes of receiving a deal (equity in exchange for funding) from Sharks. We have used this setting, as the video recordings of these pitches offered insight into a typically private negotiation process. Furthermore, while each pitch was curated for airtime by the network, edited for dramatization, and selected for television ratings (B. Smith & Viceisza, 2018), the televised nature allowed for a substantial female population from which to collect data.

Despite the curated nature of the show, the show maintained the integrity of the process, as each pitch is unscripted and concerns real companies with real money. Additionally, the show simulates most professional funding opportunities by not forcing the Sharks to invest, as they are investing with their own funds (Poczter & Shapsis, 2017). For this study, each episode was transcribed using Descript transcription services, and the entrepreneurs' speaking portions were isolated for analysis. Additional data was collected from the show and supplemented by data gathered by Halle Tecco (@halletecco), an angel investor and founder of Rock Health (Tecco, 2018).

3.4.1.2 Sample

For this study, we analyzed 256 pitches between seasons five through nine, with 127 male pitches and 129 female pitches. We started our data collection at season 5, as this was the first season that established the format of the show, including guest investors. Data collection concluded at season nine, as it was the most recently aired at the time of data collection. The

participants were either single entrepreneurs or single-gendered teams. The data set was comprised of all available female entrepreneur/entrepreneurial team pitches and a systematic sampling of male entrepreneurs or entrepreneurial teams. Based on this sample, 53% of the pitches by male entrepreneurs received a deal, while 61% of the pitches by female entrepreneurs received a deal.

3.4.1.3 Measures

3.4.1.3.1 Independent Variables

Gender was measured using a dummy variable for male and female entrepreneurs (female = 0, male = 1). Grit was measured using a content analysis approach. We used this approach because it enabled us to capture the cognition of individuals (e.g. Gamache et al., 2015; Graf-Vlachy et al., 2020). We first crafted a list of words based on the Grit-S Scale (Duckworth & Quinn, 2009). This validated scale allows an individual to evaluate and create a grit measure for another individual. We then used a thesaurus approach based on these words to create a dictionary indicative of an individual's grit, resulting in a dictionary containing 27 words⁴ (see Appendix A.3 Grit Dictionary). Finally, we used LIWC 2015 (Linguistic Inquiry and Word Count) software, to analyze each pitch and obtain the percentage of the words spoken in each pitch. For each pitch, we separately analyzed the words spoken by the entrepreneur and the words spoken by the Sharks. The resulting grit measure used was the interaction between these two.

⁴ The words used in these dictionaries were further validated in Study 2 to be reflective of the entrepreneur having grit.

3.4.1.3.2 Dependent Variables

The dependent variable used in this study was whether the entrepreneur received a deal; this was coded as a dummy variable (1-received deal, 0-did not receive a deal). Data concerning the funding was collected through the pitch transcripts.

3.4.1.3.3 Control Variables

This study used controls similar to other studies analyzing pitches and in the Shark Tank settings, such as the characteristics of the pitches, entrepreneurs, entrepreneurs' companies, and industry effects (Poczter & Shapsis, 2017; B. Smith & Viceisza, 2018). To control for any factors that may have differed due to changes in time, seasonality, or episode length, we controlled for the season using a clustered variable. Additionally, as preferences may exist in favor of specific industries, we controlled for the industry of each pitch based on the data collected from Halle Tecco (Tecco, 2018). This resulted in pitches being categorized into the following industry categories: Fashion/Beauty, Children/Education, Lifestyle/Home/Media, Food/Beverage, Health/Wellness/Fitness/Sports, Software, Tech, or Uncertain/Other. We controlled for the initial amount of requested funding, initial asking equity value, and prior sales to account for deal quality, prior performance, the value of the company, and entrepreneurial experience.

3.4.1.4 Analysis

We conducted a binomial generalized linear regression to analyze the data. The results are summarized in Tables 8 and 9 and discussed below.

Table 8: Regression Results for Shark Tank Data (Study 1)

Variable	All Entrepreneurs			All Entrepreneurs with Gender Interaction			Female Entrepreneurs Only			Male Entrepreneurs Only		
	Estimate	Std error	Z value	Estimate	Std error	Z value	Estimate	Std error	Z value	Estimate	Std error	Z value
Perceived Grit (Inv Grit * Ent Grit)	0.44**	1.33	1.83	3.6****	0.84	4.28	3.61**	0.43	2.52	0.26	0.62	0.92
Perceived Grit * Ent Gender	-	-	-	-4.53**	2.08	-2.17	-	-	-	-	-	-
Inv Grit	1.87**	.89	-2.09	-2.38**	1.05	-2.26	-2.35***	0.91	-2.59	-1.03	1.07	-0.96
Ent Grit	-0.91	0.94	-0.96	-0.52**	1.23	-0.42	-0.53	1.52	-0.35	-1.42	1.59	-0.89
Ent Gender	-	-	-	-0.14	0.52	-0.26	-	-	-	-	-	-
Log of Prior Sales	.21*	0.10	1.88	0.20*	0.11	1.89	0.20	0.18	1.16	0.20*	0.11	1.81
Log of Amount of Funding requested	-0.45**	0.20	-2.27	-0.38	0.27	-1.44	-0.22	0.81	-0.27	-0.49*	0.27	-1.87
Amount of Equity requested	0.64	1.39	0.46	0.39	1.51	0.26	1.66	2.66	0.62	0.06	3.64	0.02
Factor Industry (Fashion/ Beauty)	-0.45	0.76	-0.59	-0.46	0.79	-0.58	-0.87	1.17	-0.75	0.07	1.11	0.07
Factor Industry (Food/Beverage)	-0.59	0.41	-1.44	-0.64	0.46	-1.39	-0.95*	0.55	-1.71	-0.05	1.00	-0.05
Factor Industry (Health/Wellness/Fitness/Sports)	-0.53**	0.24	-2.21	-0.57**	0.26	-2.24	-0.96*	0.52	-1.86	-0.04	1.09	-0.04
Factor Industry (Lifestyle/Home/Media)	0.12	0.25	0.48	0.16	0.36	0.44	-0.19	0.22	-0.88	0.64	0.95	0.67
Factor Industry (Software)	0.41	0.94	0.44	0.45	0.87	0.51	0.91	2.30	0.39	0.69	0.51	1.36
Factor Industry (Tech)	-0.09	0.31	-0.29	-0.17	0.38	-0.43	-0.94	1.09	-0.86	0.38	0.72	0.53
Factor Industry (Uncertain/Other)	-0.09	0.34	-0.30	-0.07	0.42	-0.18	0.67	0.95	0.71	-0.12	1.40	-0.09
Percent Female Investors	1.83	1.33	1.38	1.73	1.12	1.54	4.11	3.13	1.31	0.27	1.21	0.22
Inv Grit * Ent Gender	-	-	-	1.58	1.67	0.94	-	-	-	-	-	-
Ent Grit * Ent Gender	-	-	-	-0.73	1.55	-0.47	-	-	-	-	-	-
Intercept	1.84****	0.46	3.97	1.65	0.76	2.17	0.06	3.82	0.02	2.19	1.85	1.19

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 9: Means, Standard Deviations, and Correlations Using Shark Tank Data (Study 1)

Variable	Mean	Std. dev.	1	2	3	4	5	6	7	8
1 Entrepreneur Gender (F = 0, M = 1)	0.50	0.50								
2 Entrepreneur Grit	0.27	0.23	-0.05							
3 Investor Grit	0.23	0.22	-0.11*	0.15**						
4 Log of Prior Sales	4.56	2.17	-0.05	0.00	-0.05					
5 Log of Amount of Funding requested	5.25	0.39	0.24	0.11*	-0.03	0.13**				
6 Amount of Equity Tequested (%)	0.14	0.08	-0.14**	-0.05	-0.02	-0.32****	-0.26****			
7 Deal (0 = No Deal, 1 = Deal)	0.57	0.50	-0.08	-0.06	-0.13**	0.16***	-0.07	-0.02		
8 Log of Amount of Funding received	3.40	2.98	-0.07	-0.06	-0.13**	0.18***	0.02	-0.07	0.98****	
9 Percent Female Investor	0.30	0.10	-0.18***	-0.02	0.06	-0.04	-0.08	0.07	0.08	0.07

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Hypothesis 1 tested whether perceived grit in an entrepreneurial venture increased the probability of the entrepreneur receiving investor funding. Our data supported our hypothesis H1 ($b = 2.44, p < 0.05$). This suggests that an entrepreneur's display of grit can significantly increase their likelihood of receiving a deal.

Our next hypothesis posited that female entrepreneurs who are perceived as gritty have a greater probability of receiving a deal than gritty male entrepreneurs. The results of the Shark Tank analysis provided significant support for H2. The data indicated, based on an interaction of perceived grit and gender, that gender was a significant factor ($b = -4.53, p < 0.05$). Furthermore, through a within-gender analysis, grit had a significantly positive association for female entrepreneurs seeking funding ($b = 3.61, p < 0.05$) and did not have a significant impact on whether male entrepreneurs received a deal. This suggests that grit exerts a gendered effect, such that the effects of grit impact female entrepreneurs more than male entrepreneurs.

3.4.1.5 Discussion

The results of the findings from the Shark Tank data set suggest that grit is positively correlated with the likelihood of an entrepreneur receiving a deal and that the effects of grit are not equally applicable to male and female entrepreneurs. We aimed to generalize the findings in a more controlled setting using the experimental design in study 2.

3.4.2 Study 2: Experimental Design

3.4.2.1 Overview

Using a vignette-style online experiment to mimic the entrepreneur-investor pitch process, study 2 aimed to enhance the generalizability of our findings by using a broader sample of investors and isolating the effect of the entrepreneur's display of grit and gender.

3.4.2.2 Sample

668 participants were recruited for this study using Amazon's Mechanical Turk. Consistent with best practices in similar studies, participants needed to be at least 18 years of age, located in the US, and have a Human Intelligence Task Rate (HIT Rate) acceptance greater than 95% to participate in the study (Cobanoglu et al., 2021; Young & Young, 2019). All duplicate entries were deleted along with any responses that failed attention checks, resulting in 439 participant responses for our analysis.

3.4.2.3 Procedure

In this experiment, participants simulated the role of investors. Participants viewed a series of pitches and were asked to choose which pitch they would like to invest in and their level of investment. All pitches in a series introduced the same product, namely a wine chiller. To examine the differences based on the entrepreneur's gender, half of the participants viewed all-male entrepreneur pitches, while the other half viewed all-female entrepreneurial pitches. In each series of pitches, participants were asked whether and how much they would invest in the venture. Following each pitch, participants answered a series of questions evaluating the level of perceived grit of the entrepreneur. To control for any potential priming effects, we randomized

the order in which participants viewed the pitches and controlled for each pitch in the analysis. All pitches asked for the same amount of funding in exchange for the same amount of equity.

3.4.2.4 Manipulations

3.4.2.4.1 Gender Manipulation

Gender was manipulated using a between-subject design. Participants were randomly assigned to two groups, with one group investing in male pitches and one group investing in female pitches. The only difference between these groups was that the male group viewed the pitches with conventionally male names, such as Bill or Ted, while the female group had entrepreneurs with conventionally female names, such as Allison or Emma. This enabled us to isolate the gender effects of the entrepreneurs by only altering the entrepreneur's name while keeping all else equal.

3.4.2.4.2 Grit Manipulation

Grit was manipulated based on the vignette that the participant was analyzing. Participants viewed a series of three pitches in random order with varying levels of words indicative of grit inserted into the vignette to represent a pitch with 1) no grit, 2) some grit, or 3) a lot of grit. The words used were based on the Grit-S Scale and utilized in study 1. This enabled us to isolate the effects of the entrepreneur's linguistic display of grit while keeping all other factors equal. Based on the questions and regression results, we found that those entrepreneurs with the greatest display of grit exhibited a marginal correlation with higher perceived grit ($b = 0.02, p < 0.1$), validating the grit manipulation and grit dictionary.

3.4.2.5 Measures

3.4.2.5.1 Independent Variables

The first independent variable we used was gender, which was coded as a dummy variable for male and female entrepreneurs (female = 0, male = 1). We indicated the gender in the pitches by using the entrepreneurs' names. Male entrepreneurs had names such as Fred and Bill, while female entrepreneurs had names such as Allison and Emma. By only changing the names of the entrepreneur presenting the pitch, we isolated the gender effects while keeping all else equal between the groups.

The second independent variable was grit. We used the Grit-S scale, validated by Duckworth (2009), to test and measure the grit of the entrepreneur. This scale enables a third-party member to evaluate an individual using questions about perceived passion and perseverance. Using a five-point Likert scale, participants were asked to evaluate the entrepreneurs based on their interpretation of the entrepreneur's pitch, scoring statements such as the following: "They have achieved a goal that took years of work" or "They are a hard worker" (Duckworth & Quinn, 2009). (See Appendix for a complete list of questions). These scores were averaged to produce a single grit score per individual, and these scores were used in the analysis of the data.

3.4.2.5.2 Dependent Variable

The dependent variable in this study was whether a pitch was funded based on participant responses. The responses were coded using a dummy binary variable (1 = deal, 0 = no deal).

3.4.2.5.3 Control Variables

To control for deal quality, all financial data and pitch information were kept the same, except for gender and grit manipulation. This included the asking investment amount, the amount of equity the entrepreneur was willing to exchange for the investment, and the amount of prior sales. We controlled for the race and ethnicity of the entrepreneurs by exclusively using conventional Caucasian names, such as Fred, Bill, Allison, and Emma. Following all questions related to the pitches, we asked participants questions about their risk preferences and backgrounds. Specifically, we asked questions to assess their risk aptitude, age, gender, whether English was a foreign language, the number of business classes that they had taken in the past, whether they self-identified as an entrepreneur, and whether they had any prior investment experience. We also controlled for the participants' passion and perceived entrepreneurial passion using questions from the passion scale (Sigmundsson et al., 2020).

3.4.2.6 Analysis

We conducted a binomial generalized linear regression to analyze the results of both studies. The regression results are in Tables 10 and 11 and are discussed below.

Table 10: Regression Results for Experimental Data (Study 2)

Sample	All Entrepreneurs			All Entrepreneurs with Gender Interaction			Female Entrepreneurs Only			Male Entrepreneurs Only		
	Estimate	Std error	Z value	Estimate	Std error	Z value	Estimate	Std error	Z value	Estimate	Std error	Z value
Perceived Grit	1.23****	0.29	4.25	1.39****	0.39	3.55	0.95**	0.39	2.41	1.50****	0.45	3.32
Perceived Grit * Ent Gender	-	-	-	-0.29	0.49	-0.59	-	-	-	-	-	-
Ent Gender	-	-	-	0.89	1.49	0.60	-	-	-	-	-	-
Perceived Passion	0.59****	0.11	5.22	0.59****	0.11	5.19	0.53****	0.15	3.44	0.71****	0.17	4.07
English as a Foreign Language	-0.28	0.29	-0.92	-0.29	0.29	-0.97	-0.48	0.33	-1.45	7.24	419.90	0.02
Participant Grit	-1.00****	0.26	-3.92	-0.98****	0.26	-3.80	-0.96***	0.32	-2.99	-1.05**	0.46	2.30
Participant Passion	0.01	0.12	0.08	0.01	0.12	0.07	-0.00	0.18	-0.01	-0.02	0.17	-0.09
Factor Pitch (2)	-0.33	0.20	-1.63	-0.33*	0.20	-1.67	-0.38	0.28	-1.36	-0.33	0.30	1.08
Factor Pitch (3)	-0.21	0.21	-1.04	-0.22	0.21	-1.06	-0.24	0.28	-0.84	-0.19	0.31	-0.64
Factor Participant Gender (Female)	-0.27	0.17	-1.58	-0.27	0.17	-1.55	-0.08	0.24	-0.33	-0.46*	0.26	-1.78
Factor Participant Gender (Other)	10.81	491.53	0.02	10.84	490.39	0.02	-	-	-	0.11	803.50	0.01
Risk	0.02****	0.00	5.27	0.02****	0.00	5.27	0.02**	0.01	5.56	0.03****	0.01	4.88
Investor Age	-0.02**	0.01	-2.11	-0.02**	0.01	-2.12	-0.02**	0.01	-1.98	-0.01	0.01	-1.11
Participant identifies as an entrepreneur	-0.27****	0.19	-1.37	-0.27	0.19	-1.38	-0.47	0.29	-1.63	-0.24	0.28	-0.85
Participant identifies as an investor	-0.83	0.18	-4.65	-0.83****	0.18	-4.66	-0.43	0.27	-1.63	-1.17****	0.26	-4.51
Number of business classes taken	-0.09	0.14	-0.67	-0.09	0.14	-0.68	-0.28	0.18	-1.53	0.11	0.22	0.50
Intercept	3.98	3.72	1.07	3.65	3.76	0.97	9.22	4.32	2.13	-81.64	4.62	-0.02

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 11: Means, Standard Deviations, and Correlations of Independent and Dependent Variables Using Experimental Data

(Study 2)

	Variable	Mean	Std. dev.	1	2	3	4
1	Entrepreneur gender (F = 0, M = 1)	0.49	0.50				
2	Perceived Grit	3.04	0.33	0.01			
3	Participant Grit	3.07	0.36	-0.02	0.47*****		
4	Deal (0 = No Deal, 1 = Deal)	0.84	0.37	0.01	0.04	-0.14*****	
5	Funding received	47.22	31.92	0.02	0.00	-0.12*****	0.65*****

Note: ***** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Hypothesis 1 tested whether perceived grit in an entrepreneurial venture increased the probability of the entrepreneur receiving investor funding. Our data provides significant support for H1 ($b = 1.23, p < 0.001$), suggesting that grit is significantly correlated with the likelihood of receiving a deal.

Our second hypothesis tested whether female entrepreneurs who were perceived as possessing higher levels of grit had a greater probability of receiving a deal than male entrepreneurs with a perceived higher level of grit. Our analysis did not uncover support for H2, indicating that there was no significant difference in the likelihood of receiving a deal between male and female entrepreneurs who displayed grit. In both within-subject models, grit was a significant positive variable in relation to the likelihood of receiving a deal (Male: $b = 1.50, p < 0.001$; Female: $b = 0.95, p < 0.05$). This suggests that the effects of grit are equally beneficial for both male and female entrepreneurs.

3.4.2.7 Discussion

The results from the experimental study indicate that grit is a characteristic that is valued by investors. Similar to Study 1, which used data from Shark Tank, we found that grit can increase an entrepreneur's probability of receiving funding. Furthermore, this study found that while there is no significant difference in how grit impacts male and female entrepreneurs, it is beneficial to both genders seeking funding opportunities. This difference in results may be due to the context of the studies. Study 1 was conducted in an environment that was curated for television; thus, additional language and gender cues were presented in the pitches that were controlled for in Study 2. These additional cues may have rendered the entrepreneurs' genders more salient to investors, increasing the discrepancy in results between genders.

3.4.3 Ad Hoc Analysis

In addition to testing the likelihood of receiving funding, we conducted regression tests to determine the impact of entrepreneurial grit on the amount of funding. When we analyzed male and female entrepreneurs together, we found that in both the Shark Tank data ($b = 4.00, p < 0.01$) and the experimental study data ($b = 0.84, p < 0.001$), grit increased the amount of funding the entrepreneur received. In both cases, a cubic regression model was the model of best fit, indicating minimal variation in the amount of funding if the grit level was between 3 and 4, and revealing significantly lower or higher funding with low or high grit levels, respectively. Interestingly, we found that in the Shark Tank data, grit positively affected the amount of funding that female entrepreneurs received ($b = 5.14, p < 0.001$), while exerting no significant impact on the amount of funding the male entrepreneurs received. In the experimental study, both male entrepreneurs ($b = 0.83, p < 0.05$) and female entrepreneurs ($b = 0.75, p < 0.05$) who displayed grit received significantly more funding than those who did not.

However, due to the overdispersion of entrepreneurs who did not receive a deal (43% in Study 1 and 17% in Study 2), we conducted a hurdle analysis with only those entrepreneurs who received a deal. In both the Shark Tank study and the experimental study, we found that, for those entrepreneurs who received a deal, grit exerted no significant impact on the amount of funding entrepreneurs received from investors, regardless of the entrepreneurs' gender. These results, along with our earlier findings, suggest that grit is beneficial in helping entrepreneurs secure funding and land a deal; however, investors may be using alternative criteria to determine the amount of funding they receive.

3.5 General Discussion

The purpose of this paper was to gain insight into how an entrepreneur's display of grit is rewarded by investors and whether the reward differs based on the entrepreneur's gender. Entrepreneurs operate under conditions of uncertainty, and due to the inherent risk present with nascent start-ups, they must find means to indicate the potential success of their venture to investors. One of the methods by which this is accomplished is through a display of grit during their pitch. Entrepreneurs who exhibit grit signal their passion and determination to make the venture succeed. This signal influences investors into selecting entrepreneurs who demonstrate grit, as they are perceived by investors to be less risky.

3.5.1 Grit and Entrepreneurial Funding

This paper contributes to the literature concerning entrepreneurship and grit (Credé et al., 2017; Mooradian et al., 2016; Murnieks et al., 2016) by uncovering the effects of grit on entrepreneurial funding. Grit is a behavioral characteristic that individuals display to indicate the likelihood of their success in many sectors and to enhance the growth and success of nascent ventures in relation to innovativeness and personal satisfaction (Mooradian et al., 2016). However, minimal insights existed to help understand the impact of an individual's grit on early-stage funding. This paper demonstrates that while displaying entrepreneurial grit does not necessarily increase the amount of funding an entrepreneur is rewarded with, grit does positively affect the likelihood of an entrepreneur receiving a funding deal from investors. This suggests that grit is a valuable characteristic for entrepreneurs, in that it aids investors in judging their commitment to their endeavor.

A major finding of this study is that the demonstration of grit does not impact male and female entrepreneurs equally. While prior studies have suggested that females tend to exhibit greater levels of grit than males (Christensen & Knezek, 2014), they have not linked this display of grit to the amount of funding an entrepreneur may receive in relation to the entrepreneur's gender. This study has found that investors account for the entrepreneur's gender along with an analysis of the entrepreneur's grit in their funding decisions. Grit may serve as a signal that enhances a female's chances of receiving funding, as it highlights their commitment to their venture. By demonstrating grit, female entrepreneurs may be able to overcome negative stereotypes and be evaluated on an equal level relative to their male counterparts.

3.5.2 Linguistic Approach to Measuring Grit

Another contribution of this study is a linguistic measure of grit. Historically, grit has been measured using a questionnaire (Al Issa, 2020; Duckworth et al., 2007; Jordan et al., 2018; Salisu et al., 2020). In this study, we created a text-based approach, based on the Duckworth's (2009) validates scale, to determining if and to what extent an individual's level of grit was perceived. To further establish the validity of this dictionary, we used the dictionary words to craft stylized vignettes for our experimental study. The manipulation checks in our experimental study supported the different levels of grit we had stylized the vignettes to represent. This text-based approach enabled us to understand and analyze the level of grit in recorded entrepreneurial pitches, contexts where we would have otherwise been unable to gather this type of information. By developing and utilizing a linguistic approach to measuring grit, we can better understand and analyze grit in different contexts and gain further insights in entrepreneurial business decisions.

3.5.3 Implications for Findings

One implication of our findings is the effect it may have on how entrepreneurs opt to present themselves when seeking investor funding. Our research demonstrates the benefits for entrepreneurs, especially females, of displaying grit when seeking investor funding.

Entrepreneurs may therefore benefit from finding methods of displaying grit in their investor pitches even if they do not possess grit themselves. By using language indicative of grit, they may exude grit to investors, thereby increasing their likelihood of receiving an investor deal.

3.5.4 Limitations and Avenues for Future Research

We used a mixed-methods approach to overcome the limitations of each of the studies. Our first study has potential limitations due to the data gathered from a televised show, ABC's Shark Tank. These pitches have been curated and condensed for television and therefore did not allow us to examine the full negotiation process, resulting in a conservative sample. To address these limitations and increase the generalizability of our findings, we conducted an experimental study that isolated the effects of the entrepreneur's grit and gender. By using the results of both studies in combination, we strengthened the findings of each study. Additionally, while we focused on capturing the effects of grit through linguistic analysis, some other aspects of grit are conveyed through body language and the tone of the speaker. We suggest that future research should further examine the non-linguistic factors of grit and their impacts on investor funding.

Another stream of future research could study the impact of race or ethnicity on entrepreneurial funding. In this paper, we controlled for race by only using conventional white names in the experiment. However, similar to gender, race can have an impact on the perceived

risk and validity of the venture. By expanding this study to include race as a factor, we may find additional information about why the disparity in funding arises.

3.5.5 Conclusion

This study has provided insight into the funding disparity in early-stage entrepreneurship by demonstrating the importance of entrepreneurial grit in funding decisions. The display of grit is not rewarded equally by investors and may be more beneficial to female entrepreneurs than male entrepreneurs. Female entrepreneurs face additional challenges when seeking funding, in part due to the detrimental stereotypes that society has placed on them due to their non-dominant gender role. This study suggests that to counteract these negative assumptions, female entrepreneurs must deliberately demonstrate characteristics that we assume male entrepreneurs possess. Through the display of grit in their pitches, these entrepreneurs exhibit their passion and commitment to their venture and therefore increase their chances of receiving investor funding. By advancing our understanding of how characteristics such as grit impact early-stage funding, we can better understand investor funding decisions and gain insight into the gender disparity in funding.

4.0 Paper 3: Risky Ventures: Entrepreneurial Leadership, Gender, and Funding

4.1 Introduction

It can be challenging for investors to make informed investment decisions when investing in new ventures where information is often limited (Davis & Olson, 2008; Shepherd et al., 2000). In such scenarios, prospect theory suggests investors' perceptions of risk and investors' risk tolerance levels often guide their investment decisions (Kahneman & Tversky, 1979; Post et al., 2008). Investors' perceptions and risk tolerance levels can significantly impact investors' decisions and influence everything from their investment choices to the amount of money that they invest (Florin et al., 2013; Söderblom et al., 2016). Understanding the impact of investors' risk perceptions and risk tolerance levels on investment decisions is key to helping investors to make strategic investment choices.

However, there is limited understanding of how the subjective measures used by investors to evaluate the entrepreneur's ability to successfully lead their nascent venture are impacted by the investor's risk perceptions and risk tolerance and how these relate to subsequent funding decisions. Research has shown that investors consider information such as entrepreneurs' motivation, passion, commitment, and gender when deciding whether to invest (Balachandra et al., 2019; Brush et al., 2018; Cardon et al., 2017; Huang & Pearce, 2015; Kanze et al., 2018). The upper echelons theory suggests that investors also consider their perceptions of entrepreneurs' leadership abilities in their evaluations of entrepreneurs (Hambrick & Mason, 1984; Kor, 2006). When making funding decisions, investors seek entrepreneurs who they believe can lead their nascent ventures to success. Furthermore, studies on leadership and gender

have found that a leader's gender plays a crucial role in shaping the perception of the leader's leadership skills (Badura et al., 2018; Harrison et al., 2015). Male and female leaders tend to differ in their decision-making, perceptions, and actions regarding risk, and they are perceived differently with regard to their commitment to their ventures (V. Gupta et al., 2009; V. K. Gupta et al., 2014; Jennings & Brush, 2013). While these differences do not necessarily indicate one gender's superiority over the other, investors may consider these differences when forming their perceptions of entrepreneurs' leadership abilities and growth potential. The gender-related differences in the perception of leadership abilities can result in investors regarding some ventures as riskier than others. The combination of investors' risk perceptions and risk tolerance levels can, in turn, significantly impact investors' funding decisions.

The purpose of this paper is to understand how investors' risk tolerance levels impact their funding decisions. Using the upper echelons theory, gender and leadership literature, and insights from behavioral economics and focusing on how the gender of entrepreneurs and their perceived leadership abilities factor into investors' funding decisions, this paper seeks to understand how investors' risk tolerance levels affect their choices of entrepreneur to invest in. The paper adopts a mixed method approach and begins with an experimental study to measure, isolate, and analyze the differences in risk tolerance levels between investors investing in female entrepreneurs and investors investing in male entrepreneurs. A study using data from CB Insights to examine real-world deals in 2022 follows the experimental study. Using a proxy measure for risk tolerance, the paper analyzes the significance of investors' risk tolerance levels for their funding decisions. This study contributes to the literature by providing insights into how investors' risk tolerance levels and risk perceptions impact their funding decisions. By focusing on how the gender of entrepreneurs influences entrepreneurs' perceived leadership abilities, the

paper aims to provide insights into how female entrepreneurs can demonstrate their leadership abilities to more effectively to influence their funding outcomes.

To construct the hypotheses, this paper opens with a discussion of investors' risk tolerance levels, the necessity for the inclusion of subjective measures in decision-making processes, and the role of entrepreneurs' leadership abilities. Subsequently, the paper discusses the research methods, measures, and analysis. The paper concludes with a discussion of the findings and implications of the study.

4.2 Theory

4.2.1 Risk Tolerance and Investor Funding

Studies have shown that receiving investments during a venture's early funding rounds can significantly impact the venture's future funding regarding the amount of funding and who the investors are (Kim & Wagman, 2016; Schwienbacher, 2013; Söderblom et al., 2016). Early-stage investors must use different evaluation criteria than investors investing in more established ventures. In the early stages, entrepreneurs often do not have an established customer base, a well-defined market into which to enter, or even a working product or service (Davis & Olson, 2008; Shepherd et al., 2000). Instead, entrepreneurs must work to convince investors of the merit of their ideas and of their entrepreneurial abilities and commitment to bringing their ideas to fruition and creating successful ventures.

Risk tolerance is integral to investors' decision-making processes. According to the prospect theory, investors' risk tolerance levels, defined based on their willingness to accept

uncertainty and potential losses in pursuit of potential gains (Finke & Guillemette, 2016; Forlani & Mullins, 2000; Kahneman & Tversky, 1979; Santacruz, 2008), significantly impact investors' investment decisions. Investors must work to balance the risks of investing in nascent ventures with the potential rewards gained from successful investments.

Investors' risk tolerance levels are formed based on investors' past experiences and investments (Söderblom et al., 2016). Specific risk tolerance factors can include gender, age, education, wealth, family life, and financial literacy (Karki & Kafle, 2020; Santacruz, 2008). Understanding the factors affecting investors' risk tolerance levels can explain how investors choose to invest and how investors' decisions align with their own goals and risk tolerance levels.

An investors' risk tolerance levels significantly influence their investment decisions. Past experiences and individual factors help to form investors' risk tolerance levels or ranges of acceptable risks that investors are willing to take when investing. Investors with higher risk tolerance levels are more willing to accept a wider range of potential outcomes, including potentially higher losses, in exchange for potentially higher returns. In line with this, studies have found that investors investing in nascent ventures tend to be more tolerant of risks than investors who only invest in more established ventures (Wong, 2012), which suggests that, while the risks associated with nascent ventures are greater than those associated with established companies, the potential for rewards is also greater.

By examining the impact of investors' risk tolerance levels on their funding decisions, we can better understand how investors make decisions that align with their personal goals and values and balance the risks and rewards of their investments. However, there is less information

on how investors' risk tolerance levels relate to their perceptions of entrepreneurs' abilities to lead nascent ventures to success.

4.2.2 Leadership and Entrepreneurship

When investing in nascent ventures, investors consider both their own risk tolerance levels and their perceptions of the risks associated with ventures in their investment decisions. Entrepreneurial leadership has been described as a dynamic process that involves presenting a vision, securing follower commitment, embracing opportunities, accepting risks, using existing resources efficiently, and identifying and utilizing new resources (Henry et al., 2015). This differs from our understanding of corporate leadership in that leaders of established firms tend to lead those with concrete products or services in mind and employees who are invested in company outcomes. Conversely, entrepreneurs are often tasked with efficiently and effectively guiding others to achieve the entrepreneurs' visions and gaining the support of others, even if the product or service has not yet come to fruition.

In a ventures' early stages, investors often cannot use concrete financial metrics to inform their risk assessments; rather, the investors incorporate subjective measures, which they become aware of during entrepreneurs' pitches, to form their perceptions of the risks associated with ventures (Huang & Pearce, 2015; McMullen & Shepherd, 2006). Studies have determined that some of the subjective measures include entrepreneurs' past successes or experiences, entrepreneurs' passion for their ideas, the language that entrepreneurs use in their presentations, and entrepreneurs' dedication and commitment to their ventures (Bernstein et al., 2017; Cardon et al., 2017; Cardon & Stevens, 2009; Chen et al., 2009; Colombo, 2021; Eddleston et al., 2016; Mohammadi & Shafi, 2018).

Entrepreneurs' abilities to lead their ventures to success form part of investors' risk perceptions. The upper echelons theory states that organizational outcomes stem from the characteristics and backgrounds of organizations' management teams (Hambrick & Mason, 1984). Similarly to how a firm's actions are reflective of the firm's top management team, the entrepreneur's venture's actions are reflective of the entrepreneur (Kor, 2006). By seeking to better understand entrepreneurs' abilities to successfully lead their ventures, investors can better assess the potential of ventures.

4.2.3 Gender, Entrepreneurship and Leadership

Men and women face different challenges when seeking investor funding. Studies have posited that the differences in the perceptions of men's and women's capabilities are rooted in role congruity (Eagly & Karau, 2002). Traditional models of gender roles date back to the early times of cavemen and are based on expectations of how each gender should act and the behaviors required to successfully perform tasks (Eagly & Karau, 2002; Mazei et al., 2019). Eagly and Karau (2002) argued that men and women are prestereotyped into roles, which results in gender-based entry barriers to certain roles. Even today, these gender stereotypes remain common and are deeply rooted in the role of power (Bandura, 1986).

Gender role congruity is especially impactful in leadership positions where women are far less likely to reach the top of the corporate ladder than their male counterparts (Montgomery & Cowen, 2020). With sayings such as "Think Manager, Think Male" (Sczesny, 2003), leadership has generally been considered a male-dominated role (Badura et al., 2018; Eagly & Karau, 2002; Harrison et al., 2015). While males are typically associated with leadership roles, women are expected to occupy supporting roles. These lower-status roles (Badura et al., 2018;

Eagly & Karau, 2002), along with society's continued expectation that women remain in these supporting roles, have led to the perception that women are not strong leaders (Reuben et al., 2012).

This perception of who makes a strong leader, along with gender role congruity, persists in the field of entrepreneurship, where males are associated with the role of the successful entrepreneur (Jennings & Brush, 2013; Malmström et al., 2017). This is supported by studies that have found that females have less economic success in negotiations (Mazei et al., 2019). In recent years, female-led ventures have only received 2–3% of VC funding (Brush et al., 2018; Global Entrepreneurship Monitor, 2016), and, while this percentage has increased, women continue to be at a significant disadvantage regarding entrepreneurial representation and funding (Sahadi, 2019).

Studies on gender and leadership have suggested that men and women have different leadership styles (Eagly & Johannesen-Schmidt, 2001; Sczesny, 2003). Specifically, female leaders differ from male leaders in their decision-making processes, their risk tolerance levels, and their perceived commitment (Abouzahr et al., 2018b; Badura et al., 2018; V. K. Gupta et al., 2014; Marlow & Swail, 2014). By exploring how leadership styles differ based on the gender of leaders, we can better understand how investors evaluate the perceived riskiness of ventures.

4.2.3.1 Commitment

Commitment is a valuable entrepreneurial attribute, especially in the early stages of ventures (Chen et al., 2009). Unlike those responsible for established companies, where leadership can change hands while the company grows, in the early stages of start-ups, entrepreneurs are often the only ones with clear visions for the future of their ventures. Without the unwavering commitment and focus of entrepreneurs, ventures' likelihood of failure increases

significantly (Khelil, 2016). Consequently, investors may regard entrepreneurs who demonstrate a strong commitment to their ventures as less risky investments (Cardon et al., 2017).

The lack of promotion of female leadership is often attributed to the misconception that women may not be as committed to their roles as their male counterparts are. This belief stems from historical gender roles whereby women have always predominantly been regarded as primary caregivers in families. Despite social progress, this belief persists, with some holding the view that female leaders may not be as dedicated to their work owing to their family obligations (Jennings & Brush, 2013; Nelson et al., 2009; Padavic et al., 2019).

The idea that female leaders lack commitment also extends to the field of entrepreneurship. Similarly to female staff in the workplaces of established companies, female entrepreneurs are often discounted, with their commitment being called into question (Abouzahr et al., 2018a; Jennings & Brush, 2013; Weisul, 2018). As an entrepreneurs' commitment is critical to establishing and growing ventures, this gender stereotype can significantly affect investors' perceptions of female entrepreneurs' abilities to take their ventures from the ideation stage to the market. Consequently, female-led ventures are often considered riskier investments than male-led ventures.

4.2.3.2 Entrepreneurial Risk-Taking and Gender

Another factor impacting investors' perceptions of entrepreneurs' leadership abilities is entrepreneurs' abilities to take risks. To investors, risk-taking can be a valuable attribute, as it can demonstrate the extent of entrepreneurs' willingness and motivation to lead their ventures to success. As entrepreneurs must often make decisions based on incomplete information, their abilities to make risky decisions are crucial for the growth and advancement of their ventures. By understanding how entrepreneurs make risky decisions, investors can improve their assessments

of the credibility of entrepreneurs, as well as influence their perceptions of the riskiness of endeavors.

Behavioral economics and psychology research has shown that men and women tend to differ in their risk-taking behaviors (V. Gupta et al., 2009; Yordanova & Alexandrova-Boshnakova, 2011). Studies have demonstrated that men are more inclined to engage in activities and make decisions that are perceived as risky than women are (Harris & Jenkins, 2006). In contexts such as financial negotiations, securing funding for new ventures, and competitive environments, men tend to exhibit more risk-taking behavior than women do (Barber & Odean, 2001; Hohnisch et al., 2014). This tendency has led to the widely held stereotype that men are more adept at managing uncertainty and risk than women are. Historical perspectives also support this view (Badura et al., 2018; Reuben et al., 2012).

In the early stages of ventures, owing to information scarcity, entrepreneurs must make risky decisions to allow their ventures to continue to progress. Therefore, investors could view the ability to make risky decisions as a key strength of entrepreneurs. Since men are said to be capable of making better decisions in the abovementioned situations because they are more willing to make risky decisions, or decisions based on incomplete information, investors could regard male entrepreneurs as less risky than female entrepreneurs, who can be more hesitant about making decisions and acting in the risk-taking context.

4.2.4 Investor Risk Tolerance and Investment Decisions

Investors must work within the boundaries of their own risk tolerance levels when making investment decisions. When faced with investing in ventures at an early stage, investors must rely on subjective measures to evaluate the nascent ventures. Therefore, investors must rely

on the characteristics of the entrepreneurs and what they could signify for the future of ventures and the potential for entrepreneurs to achieve success. One of the characteristics may be the gender of entrepreneurs and the alignment that gender is believed to have with entrepreneurs' abilities to achieve success and make decisions based on incomplete information. Despite having an equal or greater chance of making higher returns on investment, female entrepreneurs are often discounted regarding their abilities to lead ventures owing to preconceived stereotypes (Abouzahr et al., 2018b; Jennings & Brush, 2013; Weisul, 2018). Thus, this paper posits that female entrepreneurs can be perceived as riskier investments and that investors must therefore have high risk tolerance levels to invest in female-led ventures, which leads to our hypothesis:

H1: Investors with a lower risk tolerance are less likely to invest in female entrepreneurs than those investors with a higher risk tolerance who are more likely to invest in female entrepreneurs.

4.3 Investor Homophily

In addition to understanding how investors' risk perceptions and risk tolerance levels affect their funding decisions, we must consider investors' preferences regarding funding. Studies have revealed that investors are more likely to invest in those with whom they believe that they share similar characteristics, ranging from similarities in age, education, and location to similarities in ethnicity, socioeconomic status, and even gender (Lazzeretti & Capone, 2016; Qin et al., 2021; Stolper & Walter, 2019). Specifically, studies have demonstrated that investors tend to invest in those of the same gender as them (Greenberg & Mollick, 2017; Snellman & Solal, 2022).

While these similarities exist, little is known about how this homophily impacts investor funding in relation to investors' risk tolerance levels. Based on studies into gender homophily between investors and entrepreneurs, we believe that, when investors evaluate male and female entrepreneurs of the same gender as them, investors are influenced by their own gender identity, which leads them to rely more on their personal experiences when they seek to form their perceptions of the risks associated with entrepreneurs. Through their lived experiences, investors develop a more nuanced estimation of entrepreneurs' abilities to successfully lead their ventures. These experiences can override their initial perceptions of entrepreneurs and, therefore, have a greater impact on their overall perceptions of the risks associated with ventures and their subsequent funding decisions. Thus, this paper posits that the gender of investors positively moderates the relationship between investors' risk tolerance levels and investors' perceptions of the risks associated with entrepreneurs.

H2: The gender homophily between the investor and entrepreneur will positively moderate the relationship between their risk tolerance and willingness to invest such that a) Female investors are more likely to invest in female led venture and b) Male investors are more likely to invest in male led ventures.

4.4 Methodology and Analysis

We adopted a mixed method approach for this study. Study 1 used experimental data. The experimental design allowed us to ask investors specific questions to isolate the effects of risk tolerance level and gender while keeping all other factors constant. The study provided insights into the impact of investors' risk tolerance levels on funding outcomes.

Study 2 aimed to strengthen the findings of the experimental study using archival data from CB Insights. This study allowed us to add to the generalizability of our findings using real-world deal information from various sectors. Together, the studies provided significant insights into the gender funding gap and the role of investors' risk tolerance levels in funding decisions.

4.4.1 Study 1: Experimental Study

4.4.1.1 Overview

We conducted a series of experimental studies with participants from Amazon Mechanical Turk. In the experiments, participants assumed the role of investors. The participants were shown a set of pitches and were asked whether they wished to invest in a pitch and, if so, how much funding they wished to invest. The pitches were presented in vignette styles. Following the questions relating to the investment decisions, the participants were asked a series of control questions, including questions to evaluate each investor's risk tolerance level.

4.4.1.2 Sample

We gathered data from 668 participants using Amazon Mechanical Turk. Based on the best practices cited in Cobanoglu et al. (2021) and Young and Young (2019), all participants were required to be located in the United States, be at least 18 years of age, and have a human intelligence task rate (HIT rate) acceptance greater than 95% to participate in the study. We used the 439 participant responses that remained in our analysis, after disqualifying any participants that failed attention checks.

4.4.1.3 Procedure

The experiment involved participants assuming the role of investors and being presented with a series of pitches for a wine chiller product. The participants were asked to select which pitch they wished to invest in and the amount of investment funding, with all pitches seeking the same amount of funding and offering the same amount of equity. Following their investment decisions, participants answered a series of questions to gather information on their risk tolerance levels and demographics.

4.4.1.4 Gender Manipulation

The study used a between-subjects design to manipulate gender. Participants were randomly assigned to two groups, with one viewing pitches from entrepreneurs with conventionally male names and the other viewing pitches from entrepreneurs with conventionally female names. By only changing the entrepreneurs' names, the study isolated the effects of gender on investment decisions while keeping all other factors equal.

4.4.1.5 Measures

4.4.1.5.1 Independent Variable

The independent variable was the investors' risk tolerance. We used a lottery-type question to evaluate each participant/investor's risk tolerance level (Loewenstein & Molnar, 2018). Participants' responses ranged from 0–100, with 0 representing a low risk tolerance level and 100 representing a high-risk tolerance level.

4.4.1.5.2 Dependent Variable

The dependent variable was gender. Gender was conveyed in the pitches through the entrepreneurs' names. The male entrepreneurs had names such as Bill and John, while the female entrepreneurs had names such as Sue and Emma. By only changing the names of the entrepreneurs presenting each pitch, we isolated the gender effects while keeping everything else equal between groups.

4.4.1.5.3 Control Variables

To control for deal quality, we set all financial data and pitch information the same. We also recorded the funding amounts of each pitch based on the money invested using the participants' responses. This included the asking investment amount, the amount of equity that the entrepreneur was willing to exchange for the investment, and the amount of previous sales. We controlled for the race and ethnicity of the entrepreneurs by only using typical Caucasian names, such as Bill, John, Sue, and Emma. Following all the pitch-related questions, we asked the participants questions about their backgrounds, including their ages, genders, ethnicities, levels of education, and number of business classes. In addition, we asked the participants whether they believed that the genders of the entrepreneurs affected the entrepreneurs' responses and whether they self-identified as entrepreneurs. Additionally, as these data were collected over multiple years, we controlled for the time of the data collection.

4.4.1.6 Analysis and Results

We first conducted a generalized linear regression to analyze the results of these studies. The results are summarized in Tables 12, 13, and 14.

Table 12: Regression Results for Experimental Data (Study 1)

Variable	Estimate	Std error	Z value
Risk	0.01**	0.01	2.05
Average Fund	-0.00	0.00	-0.92
Investor Age	-0.01	0.01	-1.26
Investor Gender	0.26	0.22	1.14
Factor Education (4-year degree)	0.03	0.58	0.06
Factor Education (Doctorate)	-0.72	1.72	-0.42
Factor Education (High School Graduate)	-0.87	0.87	-1.00
Factor Education (Master)	-0.72	0.61	-1.18
Factor Education (Professional Degree)	-1.15	0.80	-1.44
Factor Education (Some College)	-1.20	0.87	-1.38
Factor Investor Ethnicity (Asian)	1.14	1609	0.00
Factor Investor Ethnicity (Black or African American)	17.73	1194	0.02
Factor Investor Ethnicity (Other)	33.46	2680	0.01
Factor Investor Ethnicity (White)	17.07	1194	0.01
Number of business classes taken	0.01	0.04	0.20
Participant started their own business	-0.29	0.31	-0.94
Participant identifies as an entrepreneur	0.04	0.30	0.14
Participant identifies as an investor	0.01	0.27	0.33
English as a Foreign Language	17.09	1079	0.02
Intercept	-34.17	160.9	-0.02

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 13:

**Means, Standard Deviations, and Correlations of Independent and Dependent Variables
Using Experimental Data (Study 1)**

Variable	Mean	Std. dev.	1	2	3	4
1 Entrepreneur gender (F = 0, M = 1)	0.49	0.50				
2 Perceived Grit	3.04	0.33	0.01			
3 Participant Grit	3.07	0.36	0.02	0.47****		
4 Deal (0 = No Deal, 1 = Deal)	0.84	0.37	0.01	0.04	-0.14****	
5 Funding received	47.22	31.92	0.02	0.00	-0.12****	0.65****

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Table 14: Results from Welches T-Test using Experimental Data (Study 1)

	Value
Average Risk for Female Entrepreneur	57.07
Average Risk for Male Entrepreneur	54.10
T Value	1.47
Df	399
<i>p</i> value	0.07

The regression analysis showed that the investors' risk tolerance levels were a significant factor in relation to the gender of the entrepreneurs ($b = 0.01, p < 0.05$). Moreover, the analysis indicated that the investors who invested in female entrepreneurs tended to have higher risk tolerance levels than the investors who invested in male entrepreneurs. A Welch's *t*-test, which showed that the investors who invested in female entrepreneurs had significantly higher risk tolerance levels than the investors who invested in male entrepreneurs ($p < 0.1$), further supported this finding. The data did not provide support for Hypothesis 2, which suggests that the gender of investors does not influence investors' funding decisions.

4.4.1.7 Discussion

Our analysis revealed that the investors tended to have higher risk tolerance levels when investing in female entrepreneurs than male entrepreneurs. However, owing to the within-subjects design, the investors did not have a choice between investing in female or male entrepreneurs. Instead, the randomization of the experimental design allowed us to observe a general finding between the investors' risk tolerance levels and the gender of the entrepreneurs. Furthermore, this study provided no support for Hypothesis 2, which could be attributed to the lack of salience of the gender of the entrepreneurs, as the investors could only determine the gender of the entrepreneurs by reading their names. To further test our hypotheses and increase the generalizability of our findings, we followed this study with a study using archival data to

provide additional insights into how investors' risk tolerance levels affect their investment decisions.

4.4.2 Study 2: Field Study using Archival Data

4.4.2.1 Overview

We decided to further analyze this phenomenon using real-world deal information. We gathered data from CB Insights, as it provides deal-level information for series A-E+ funding, along with information about the investors and the founding entrepreneurial teams. By using information pertaining to real-world deals, we add to the generalizability of our Study 1 findings by exploring the impact of the investors' risk tolerance levels on funding.

4.4.2.2 Sample

We collected data from CB Insights. We analyzed all the investors identified as "Angel Investor" ("Individual") who made a Seed/Angel/Series A-E+-level deal in 2022. Both the investor and the company were required to be headquartered in the United States to account for any cultural differences. The database was further filtered by only the deals that had a recorded monetary value of more than \$1. We limited the investors by ensuring that they had at least two deals recorded in the database. This resulted in a list of 771 investors.

4.4.2.3 Measures

4.4.2.3.1 Independent Variable

The independent variable was the investors' risk tolerance. Consistent with other studies, owing to the intangibility of risk tolerance, we used the spread of the investors' investments to

calculate the investors' risk tolerance levels (Finke & Guillemette, 2016; Hvide & Panos, 2014; Santacruz, 2008). The investors were deemed to have higher risk tolerance levels if they invested at the "Seed" stage than if they invested at later stages, such as in the "Series E" or "Series F" funding rounds. Based on this premise, we calculated risk tolerance using a weighted average of the investors' deals in 2022, placing the most weight on deals at the "Seed/Angel" stage and the least weight on deals at the "Series E+" stage. The investors' risk tolerance levels ranged from 0.04–0.8, with an average of 0.44.

4.4.2.3.2 Dependent Variable

The dependent variable was the number of female-founded ventures that received funding. We recorded the number of "Seed/Angel"-level deals where solely females comprised the founding team. We also recorded a variation of this measure, reflective of the founding team having at least one female member.

4.4.2.3.3 Control Variables

We controlled for variables to account for differences in the investors, entrepreneurs, and deals. Based on the investors' CB Insights bios, we recorded the gender of the investors and whether they were considered entrepreneurs. We also controlled for the total number of deals that the investors made in 2022, the total number of deals recorded (lifetime investments), the percentage of the 2022 deals that were made at the "Seed/Angel" stage, the average funding amount that the investors invested in the "Seed/Angel" deals, the average size of the "Seed/Angel" deals, and the number of different companies with which these deals were made. We also controlled for the number of "Series A–E+" deals with female-founded companies and the number of exits that the investors had in 2022.

4.4.2.4 Analysis and Results

We conducted a generalized linear regression using R to analyze our results. The results are summarized in Tables 15 and 16.

Table 15: Regression Results for Number of Seed/Angel Deals with Female Founders Using CB Insights Data (Study 2)

Variable	Seed Number of Deals with at least 1 Female Founders			Seed Number of Deals with ONLY Female Founders		
	Estimate	Std error	Z value	Estimate	Std error	Z value
Weighted Average Percent of the deals that were Seed	3.99****	0.89	4.51	3.16**	1.34	2.36
Number of deals completed in 2022	1.86****	0.29	6.40	2.04****	0.43	4.69
Number of Companies	-0.05	0.46	-0.11	-2.39**	1.18	-2.02
Total Number of Deals	-0.65	0.52	-1.26	1.95	1.23	1.59
Average Seed Funding	-0.01***	0.00	-2.87	0.00	0.01	-0.67
Average Seed Deal Size	-0.01	0.01	-0.45	0.01	0.02	0.59
Investor Gender 1F	0.00	0.01	0.44	-0.02	0.01	-1.13
Investor Ent 1Y	0.92****	0.17	5.53	1.38****	0.23	5.97
Number of Exits	0.26	0.16	1.62	0.29	0.23	1.25
Intercept	0.14	0.21	0.67	0.01	0.31	0.03
	-3.72****	0.29	-12.98	-4.77****	0.43	-11.00

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

**Table 16: Means, Standard Deviations, and Correlations of Independent and Dependent Variables Using CB Insights Data
(Study 2)**

Variable	Mean	Std. dev.	1	2	3	4	5	6	7	8	9	10	11
1 Number of Seed/Angel Deals with ONLY Female Founder	0.12	0.41											
2 Number of Seed/Angel Deals with at least 1 Female Founder	0.27	0.61	0.76 ****										
3 Weighted Average	0.44	0.46	0.40 ****	0.57 ****									
4 Percent of the deals that were Seed	0.58	0.45	0.18 ****	0.25 ****	0.08 **								
5 Number of deals completed in 2022	1.71	1.92	0.36 ****	0.52 ****	0.98 ****	-0.02							
6 Number of Companies	1.7	1.88	0.35 ****	0.51 ****	0.98 ****	-0.02	1.00 ****						
7 Total Number of Deals	10.17	25.16	0.37 ****	0.42 ****	0.65 ****	-0.03	0.64 ****	0.64 ****					
8 Average Seed Funding	1.11	10.86	0.02	0.04	0.06 *	0.07 *	0.06	0.06	0.05				
9 Average Seed Deal Size	6.16	13.73	0.16 ****	0.29 ****	0.45 ****	0.25 ****	0.41 ****	0.41 ****	0.29 ****	0.83 ****			
10 Investor Gender 1F	0.17	0.37	0.15 ****	0.11 **	-0.06	-0.04	-0.05	-0.05	-0.09 ***	-0.02	-0.03		
11 Investor Ent 1Y	0.35	0.48	0.05 ****	0.09 **	0.14 ****	0.04	0.14 ****	0.13 ****	0.22 ****	-0.01	0.07 *	-0.19 ****	
12 Number of Exits	0.15	0.54	0.19	0.26 ****	0.48 ****	-0.01	0.48 ****	0.48 ****	0.70 ****	0.04	0.24 ****	-0.09 **	0.25 ****

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

Our hypothesis posited that investors with higher risk tolerance levels are more likely to invest in female-led ventures. We first tested this hypothesis using a dependent variable that only counted ventures with female founding teams at 100% as female entrepreneurs. Our data supported our hypothesis ($b = 3.53, p < 0.01$), suggesting that the higher the investors' risk tolerance levels, the more likely they are to invest in female entrepreneurs. Furthermore, we expanded our study to include ventures with at least one female on the founding team. This expanded dataset also provided significant support for our hypothesis ($b = 4.04, p < 0.001$), indicating that investors with higher risk tolerance levels are more likely to invest in female-founded ventures, regardless of the composition of the founding team (all female or mixed).

Welch's *t*-tests, Tables 17 and 18, which showed that the investors who invested in female entrepreneurs had significantly higher risk tolerance levels than the investors who invested in male entrepreneurs ($p < 0.1$), further supported these findings.

Table 17: Results from Welches T-Test for Ventures with Only Female Founders Using CB

Insights Data (Study 2)

	Value
Average Risk Tolerance of Investors for Female Only Founded Ventures	1.16
Average Risk Tolerance of Investors for Male Founded Ventures	0.89
T Value	2.14
Df	208
<i>p</i> value	0.017

Table 18: Results from Welches T-Test for Ventures with Female Founders Using CB

Insights Data (Study 2)

	Value
Average Risk Tolerance of Investors for Female Founded Ventures	1.09
Average Risk Tolerance of Investors for Male Founded Ventures	0.89
T Value	2.24
Df	528
<i>p</i> value	0.013

Our second hypothesis posited that the gender of investors moderates the relationship between investors' risk tolerance levels and the gender of funded entrepreneurs. We found support for H2a ($b = 2.02, p < 0.005$), indicating that, for female only-led ventures, the gender of investors positively moderates the investment decision. However, we did not find support for H2b, indicating that the gender of investors has no significant impact on funding decisions regarding male-led ventures.

Table 19: Regression Results for Number of Seed/Angel Deals with Female Founder with Investor Gender interaction Using CB Insights Data (Study 2)

Variable	Number of Seed/Angel Deals with Only Female Founders			Number of Seed/Angel Deals with Only Male Founders		
	Estimate	Std error	Z value	Estimate	Std error	Z value
Risk Tolerance * Investor Gender	2.02***	0.67	3.02	0.79	0.58	1.37
Risk Tolerance	1.95	1.39	1.41	2.95****	0.56	5.25
Investor Gender (1 female, 0 male)	0.37	0.43	0.85	-0.87***	0.32	-2.72
Percent of deals that are Seed/Angel Level	2.20****	0.46	4.76	1.82****	0.18	10.33
Number of Deals completed in 2022	-2.31*	1.26	-1.83	-1.23***	0.39	-3.19
Number of Companies invested in in 2022	2.10*	1.28	1.65	0.76*	0.44	1.75
Total Number of Deals completed in lifetime	0.00	0.01	0.29	-0.01***	0.00	-3.21
Average funding amount for seed/angel level deal	0.01	0.02	0.30	0.00	0.01	-0.41
Average total deal size for seed/angel level deal	-0.01	0.01	-0.68	0.00	0.01	0.58
Investor is an entrepreneur	0.32	0.23	1.37	0.02	0.09	0.16
Number of Exists in 2022	-0.17	0.31	-0.56	0.11	0.12	0.92
Intercept	-4.80****	0.46	-10.54	-2.23****	0.17	-13.21

Note: **** $p < 0.001$, *** $p < .01$, ** $p < .05$, * $p < 0.1$

4.4.2.5 Discussion

Based on a generalized linear regression, we found that the investors with higher risk tolerance levels and wider spreads of investments were significantly more likely to have made a “Seed/Angel”-level deal with a female founder, which suggests that investors view female-led ventures as riskier investments than male-led ventures.

When exploring the impact of the investor–entrepreneur gender homophily on funding decisions, we found that the gender of the investors was only significant for female-led entrepreneurial teams. The data suggest that female investors are more likely to invest in female

only-led entrepreneurial teams than male investors are; however, once a male entrepreneur is on the founding team, the impact of the gender homophily is no longer significant for investment decisions.

4.5 General Discussion

The purpose of this study was to understand how investors' risk tolerance levels affect their funding decisions by considering the gender of entrepreneurs. When faced with making investment decisions with limited information, investors must develop methods for evaluating ventures' potential. By considering the gender of entrepreneurs as an indication of their perceived leadership abilities, investors may determine the riskiness of entrepreneurs' ventures. These risk perceptions, coupled with investors' risk tolerance levels, are then used to influence investors' likelihood of investing and whom investors choose to invest in. Additionally, investors' personal preferences and experiences are shown to impact their investment decisions, thereby affecting how they perceive risks. The more that investors' risk tolerance levels, risk perceptions, and gender are incorporated into understanding investors' investment decisions, the more insights can be gained into how investors choose whom they invest in.

4.5.1 Investor Risk Tolerance, Risk Perceptions, and Funding Decisions

One main finding of this paper is that investors' risk tolerance levels differ when investing in either male-led or female-led ventures. When exploring the effects of investors' risk tolerance levels and investors' perceptions of the risks associated with entrepreneurial ventures,

we posited that, based on the gender of entrepreneurs, there was a difference in risk tolerance levels owing to investors' perceptions of entrepreneurs' leadership abilities. We found that, while the investors' risk tolerance levels were significant in their investment decisions, the investors tended to have higher risk tolerance levels when investing in female-led ventures than when investing in male-led ventures.

This finding suggests that investors perceive female-led ventures as riskier investments, which means that investors regard female-led ventures as being more likely to fail or not to generate expected returns. However, recent studies have shown that female entrepreneurs tend to make higher returns on investments than their male counterparts do (Abouzahr et al., 2018b; Weisul, 2018), which could indicate that the perceptions of male entrepreneurs being better at making decisions based on incomplete information may not be correct. Unlike male leaders who tend to act more in their own self-interest, females are often discounted owing to their communal approach to leadership (Eagly & Johannesen-Schmidt, 2001; Poczter & Shapsis, 2017). When females attempt to counteract this, they often face negative repercussions (Badura et al., 2018; Guadagno & Cialdini, 2007; Mazei et al., 2019). However, when females act in accordance with gender roles, they are perceived as acting more in the benefit of the organization over their own self-interest, which can ultimately aid them to make more advantageous decisions with less information. Through a better understanding of how investors' risk tolerance levels affect their perceptions of female-led ventures, female entrepreneurs can be coached to display certain characteristics to reduce the riskiness of their ventures and increase their chances of securing funding.

4.5.2 Investor Homophily

The second main finding of this study is the importance of investor homophily regarding female-founded ventures. While studies have demonstrated the presence of an investor–entrepreneur gender homophily, this study has gained additional insights to show that gender homophily can override investors’ risk tolerance levels. We did not find any gender-based investor preferences regarding male-led ventures, which suggests that male-led ventures are evaluated equally by both male and female investors. However, our findings show that female investors are more likely to invest in female-founded ventures. Female investors may consider their own lived experiences when forming their perceptions of the risks associated with female-led ventures, overcoming the negative risk associations often coupled with being a female leader. This suggests that, to improve their chances of securing funding, female entrepreneurs should aim to pitch their ventures to audiences with a larger proportion of potential female investors.

4.5.3 Limitations and Avenues for Future Research

Our study adopted a mixed method approach to seek to overcome some of the limitations of each individual study. In Study 1, owing to the experimental design, we were limited in the presentation of the gender of the entrepreneurs. We focused on using text analysis, with participants reading a vignette with the entrepreneurs’ names and deciding whether to invest or not. However, in reality, investors can often interact with entrepreneurs, thereby obtaining more salient information about entrepreneurs and their genders. Future research could examine nonlinguistic factors, such as body language and image, to better understand how the gender of entrepreneurs impacts investors’ funding decisions.

Additionally, our study used experimental data to gather information about risk tolerance and analyzed historical data to create a proxy for the archival data to further understand the impact of risk tolerance levels on investment decisions. Future research could investigate the relationship between investors' risk tolerance levels and perceptions of the risks associated with ventures using other measures, such as targeted surveys and interviews.

Future studies could also focus on exploring the influence of both entrepreneurs' and investors' ethnicities and backgrounds on funding decisions. Previous research has demonstrated the impact that these factors can have on investment decisions. By providing additional insights into how these characteristics can impact entrepreneurs' perceived leadership abilities, future research could provide a deeper understanding of the decision-making processes of investors.

4.5.4 Conclusion

This study provides insights into the factors that influence investors' decisions regarding the funding of early-stage ventures, particularly female-led ventures. The findings indicate that investors tend to have higher risk tolerance levels when investing in female-led ventures, which reveals a perception that female-led ventures are riskier. However, the study also reveals that personal experiences may help female entrepreneurs to overcome such risk perceptions, with female investors being more likely to invest in female-led ventures based on personal experiences. Given the considerable gender disparity in early-stage entrepreneurial funding, the results of this study underscore the necessity to better understand how the characteristics of investors and entrepreneurs impact investment decisions. Ultimately, by addressing the fact that investors perceive female-led ventures as riskier, it may be possible to increase funding for such ventures and foster a greater gender equity in the entrepreneurial ecosystem.

5.0 Conclusion

This dissertation provides insights into the persistent disparity in funding outcomes for female entrepreneurs and sheds light on the impact of entrepreneurial characteristics and gender dynamics during the pitch process. The findings suggest that female entrepreneurs who exhibit characteristics typically associated with successful male entrepreneurs, such as overconfidence, the illusion of control, generalizing from small numbers, and grit, may increase their chances of securing funding. Moreover, the research highlights the role of gender homophily, where female entrepreneurs are more likely to receive funding from female investors. However, the research also suggests that there may be a perception among investors that female entrepreneurs are riskier investments, which could contribute to the observed funding disparities.

This research makes theoretical and practical contributions to the literature on gender and entrepreneurship, emphasizing the importance of addressing unconscious biases and promoting diversity in funding decisions. The findings have practical implications for female entrepreneurs, emphasizing the need for strategic communication and presentation during the pitch process.

Overall, this research underscores the importance of fostering a more inclusive and equitable entrepreneurial ecosystem for female entrepreneurs. By understanding the factors that influence funding outcomes and promoting diversity, investors, and entrepreneurs can collaborate towards creating a level playing field and fostering greater gender diversity in entrepreneurship. Further research and interventions in this area can contribute to empowering female entrepreneurs and promoting gender equality in the entrepreneurial landscape.

Appendix A Dictionaries

Dictionary words were processed using multiple tenses and plurals.

Appendix A.1 Overconfidence Dictionary

List of words used to measure Overconfidence.

- Advance
- Assure
- Best
- Certain
- Commit
- Confident
- Determine
- Dominate
- Exception
- Experience
- Far out
- Feel certain
- Improve
- Incomparable
- Inimitable
- Innovative
- Matchless
- Most
- Novel
- Once in a lifetime
- Optimistic
- Origin
- Passion
- Peerless
- Perfect
- Pledge
- Positive
- Prevail
- Radical
- Revolutionize
- Standout
- Start of the art
- Supreme
- Take an oath
- There is a market
- Unequal
- Unexampled
- Unimaginable
- Unique
- Unmatched
- Unparallel
- Unprecedented
- Unrivaled
- Unsurpassed

Appendix A.2 Illusion of Control Dictionary

List of words used to measure Illusion of Control.

- Alter
- Answer For
- Capable
- Change
- Command
- Commit
- Control
- Covenant
- Deal With
- Direct
- Discriminate
- Ensured
- Guaranteed
- Handled
- Influence
- Knew
- Know
- Lead
- Manage
- Master Of
- Obligated
- Persistent
- Realize
- Revive
- Run Things
- Stipulate
- Undertake
- Versed
- Vow
- Will

Appendix A.3 Grit Dictionary

List of words used to measure Grit.

- Diligent
- Doer
- Execute
- Finish
- Fixate
- Focus
- Follow through
- Fortitude
- Passion
- Goal
- Grit
- Gut
- Hard work
- Meet
- Moxie
- New idea
- Obsess
- Overcome
- Persevere
- Resolute
- Resolve
- Serial
- Setback
- Success
- Tenacity
- Tough

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