# AN ABSTRACT OF THE DISSERTATION OF

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Title: The Influence of Entrepreneurs' Physical and Cognitive Traits on Entrepreneurial Outcomes.

Abstract approved:

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Jonathan D. Arthurs

The dissertation examines the effect of two separate yet significant individual level factors—physical and cognitive traits—on entrepreneurial outcomes. The physical factor on which the dissertation focuses is the entrepreneur's vocal cues and the cognitive traits that the dissertation investigates are the entrepreneur's goal orientation and his/her ability to take perspectives. Using theories of information processing and expectancy violations, the dissertation examines whether and how vocal attractiveness impacts individual investors' information retention, attraction towards the venture, and willingness to invest. The results from controlled lab experiments across two samples suggest that vocal attractiveness increases information retention and venture attraction and the effect of vocal attractiveness on entrepreneurial outcomes is mediated through processing fluency and positive affect. Also, the effects of vocal attractiveness on processing fluency and positive affect is conditional on whether the investors' expectations regarding the entrepreneurs' vocal attractiveness is positively or negatively violated. Thus, entrepreneurs' vocal attractiveness facilitates information retention and leads to higher levels of venture attraction through cognitive and affective routes and investors' expectations play an important role in their decision-making.

The dissertation also examines the impact of entrepreneurs' sex and gendered voice on entrepreneurial outcomes. Entrepreneurs often portray their masculinity or

femininity through gendered voice. Using the gender role stereotyping theory, the dissertation identifies sex-typed services or products offered by the entrepreneurs as another source of information that investors can readily access and incorporate in their decision-making. Contrary to the extant literature, the dissertation finds that wholesale adoption of masculinity during pitching entrepreneurial ventures is detrimental, especially for female entrepreneurs. The results from a controlled lab experiment suggest that, investors are more likely to invest when entrepreneurs present a masculine (feminine) service in a masculine (feminine) voice, irrespective of their biological sex. Thus, investors don't always prefer masculinity over femininity in entrepreneurial pitching, rather, investors' decisions are impacted by the interactions of entrepreneurs' sex, gendered voice, and sex-typed services or products offered by the entrepreneurs.

Finally, the dissertation examines the effect of cognitive traits on entrepreneurial creativity. Creativity lies at the heart of entrepreneurship as entrepreneurs often start with a creative idea that they turn into a viable venture. Using the goal orientation theory, the dissertation suggests that goal orientation is an antecedent of entrepreneurial creativity and the effect of goal orientation on entrepreneurial creativity is partially mediated through entrepreneurs' ability to take users' perspectives. In addition, the indirect effects of perspective taking on entrepreneurial creativity is contingent on individual-level moderators such as entrepreneurial exhaustion and experience. The results from two cross-sectional surveys of entrepreneurship students and a two-wave, lagged survey of entrepreneurs suggest that perspective taking mediates the relationship between goal orientation and entrepreneurial creativity and the indirect effects of perspective taking is conditional on the personal-level moderators. Thus, the dissertation disentangles the role of cognitive processes in facilitating entrepreneurial creativity.

# The Influence of Entrepreneurs' Physical and Cognitive Traits on Entrepreneurial Outcomes

by
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Dean of the Graduate School

I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

Nusrat Farah, Author

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# DEDICATION

To

My Parents, Extended Family, and Teachers

For their sacrifice, love, support, and strength

# THE INFLUENCE OF ENTREPRENEURS' PHYSICAL AND COGNITIVE TRAITS ON ENTREPRENEURIAL OUTCOMES

## CHAPTER 1: INTRODUCTION

Entrepreneurial activity plays an important role in creating new ventures and innovation. So, entrepreneurial scholars have long been interested in understanding the factors that drive entrepreneurial outcomes. Prior research on entrepreneurship have examined personality traits, socio-cognitive, organizational and managerial factors to explain entrepreneurial outcomes and success (Baum & Locke, 2004). However, there is no entrepreneurship without the entrepreneur (Poon, Ainuddin, & Junit, 2006: 62) because entrepreneurs are the drivers of the entrepreneurial processes and activity (Johnson, 1990). Also, entrepreneurs' personal characteristics have been found to be dominant predictors of entrepreneurial success (Sexton, 2001). Therefore, it is crucial to investigate entrepreneurship at the individual level using trait-based approach and examine the effects of entrepreneurs' physical and personal characteristics on entrepreneurial outcomes.

This research aims to revive the interests in examining the impact of entrepreneurs' physical and cognitive traits on entrepreneurial outcomes. Specifically, the studies report the influence of entrepreneurs' vocal cues and cognitive processes on several entrepreneurial outcomes such as funding success and entrepreneurial creativity. As voice is a unique characteristic that carries socially relevant information about traits and personality (Latinus & Belin, 2011), it has important consequences in the context of entrepreneurial pitching and may explain why some entrepreneurs are more successful than others in persuading potential investors. Also, entrepreneurs can engage in distinct cognitive processes that can lead to entrepreneurial opportunity identification and success (Mitchell et al., 2002). The research, thus, supports the case for renewed attention to entrepreneurs' physical and cognitive characteristics as the findings suggest that entrepreneurs' physical and cognitive characteristics have profound impact on entrepreneurial outcomes and investment decision-making.

## 1.1 Research Questions and Motivations for the Studies

### 1.1.1 Vocal Attractiveness and Entrepreneurial Outcomes

Vocal attractiveness refers to degree to which a voice is perceived as beautiful or pleasing compared to other voices (Babel & McGuire, 2015). Social psychology researchers have investigated the influence on vocal attractiveness on personality judgements and interpersonal attraction (Oguchi & Kikuchi, 1997) and suggested that vocally attractive individuals are judged more favorably than vocally unattractive individuals (Zuckerman, Hodgins, & Miyake, 1990). Recently, researchers in strategy and entrepreneurship have also started to focus their attention on investigating how entrepreneurs' physical attributes can impact investment decisions. However, there is a gap surrounding the influence of vocal cues in the entrepreneurial context. Accordingly, we aim to investigate whether and how vocal attractiveness impacts individual investors' information retention and attraction towards the venture in the context of entrepreneurial pitching. As entrepreneurs attempt to persuade investors to support their new ventures, it is critical to identify factors that lead to continued discussion with investors and funding success. Therefore, the first study seeks to answer the question whether vocally attractive entrepreneurs are more persuasive and perform better in negotiations than vocally unattractive entrepreneurs.

### 1.1.2 Gendered Voice and Entrepreneurial Outcomes

During the delivery of funding pitches, entrepreneurs try to convince the investors that they are a perfect fit for the entrepreneurial venture (Bird & Schjoedt, 2009; Clarke, Cornelissen, & Healey, 2018). They often try to persuade investors by displaying appropriate gendered behaviors as investors have gendered expectations regarding how entrepreneurs should act, behave, speak, response during a venture pitch (Balachandra, Briggs, Eddleston, & Brush, 2013, 2019; Kanze, Huang, Conley, & Higgins, 2018). Entrepreneurship has often viewed as an occupation with masculine identity as it requires agentic qualities, leadership abilities, dominance, and assertiveness (Bruni, Gherardi, & Poggio, 2004a; Brush, Greene, Balachandra, & Davis,

2018; Skelly & Johnson, 2011). These notions of entrepreneurship have frequently put female entrepreneurs in a disadvantageous position (Balachandra et al., 2013, 2019; Brush et al., 2018; Gatewood, Carter, Brush, Greene, & Hart, 2003). As speakers often express their gender identity of masculinity or femininity through voice (Biemans, 1999; Smith, 1985; Weirich & Simpson, 2018), entrepreneurs' use of gendered voice during pitching can provide subtle cues to persuade investors. While previous literature has suggested that women should portray masculinity during pitch presentations to convince investors (Balachandra et al., 2013, 2019; Buttner & Rosen, 1988; Kanze et al., 2018), such wholesale adoption of masculinity and aggressiveness can lead to negative outcomes for female entrepreneurs as such portrayal of masculinity contradicts with investors' gender role expectations and can lead to prejudice and backlash (Eagly, 1997). Therefore, the second study scrutinizes the interactive effect of entrepreneurs' sex, gendered voice and type of offered service on funding success.

### 1.1.3 Entrepreneurial Cognition and Creativity

Entrepreneurial scholars and practitioners unequivocally agree that creativity plays an important role in the entrepreneurial context (Baron & Tang, 2011; Ward, 2004). In essence, creativity is the soul of entrepreneurship (Morris & Kuratko, 2002: 104) that drives opportunity recognition (DeTienne & Chandler, 2007; Dimov, 2007), firm innovation (Sarooghi, Libaers, & Burkemper, 2015) and business growth (Gielnik, Frese, Graf, & Kampschulte, 2012). While entrepreneurial creativity is an important antecedent to entrepreneurial processes, surprisingly little is known about what cognitive processes and factors drive entrepreneurs' levels of creativity. Given this, the third study examines the cognitive processes that drive entrepreneurial creativity. In addition, the third study analyzes the contingent impact of personal-level moderators on the relationship between cognitive processes and entrepreneurial creativity.

## 1.2 Organization of the Dissertation

The dissertation consists of three separate studies related to entrepreneurs' physical and cognitive traits. Chapter 2 presents the first study which deals with whether and how entrepreneurs' vocal attractiveness impacts venture attraction and information retention. Chapter 3 reports the second study which identifies the interactive effect of entrepreneurs' sex, gendered voice, and sex-typed services on investors' decisions and preferences. Chapter 4 documents the third study which focuses on the cognitive factors that lead to increased entrepreneurial creativity. Finally, Chapter 5 summarizes the findings of the three studies and their implications for practitioners and academicians.

# CHAPTER 2: LIKE WHAT YOU'RE HEARING? IMPACT OF ENTREPRENEURS' VOCAL ATTRACTIVENESS ON INFORMATION PROCESSING OF INDIVIDUAL INVESTORS

## 2.1 Introduction

> "This whole Holmes situation, the image manipulation, dressing like Steve Jobs, trying to sound a particular way — it sounds like an awful lot went into façade. People generally like to be liked, and things like voice are salient differences that stick out and have positive associations. We're more likely to try and highlight those aspects, and apparently, in some cases, maybe even create them."
>
> −Remarks from O'Connor J. J., Assistant Professor of Psychology at Concordia University on the ousted Theranos founder, Elizabeth Holmes's fake deep voice

Many entrepreneurs face challenges in successfully delivering the funding pitches to persuade the investors to support their aspiring new ventures. While entrepreneurial scholars have investigated different factors that are important for investors when entrepreneurs pitch to them, there is a gap surrounding the factors which make the funding pitches successful and effective. Our research offers one of the important yet overlooked factor that can impact the effectiveness of entrepreneurial pitching and help entrepreneurs in attaining greater success. In contrast to previous research which focused mostly on several pitch-framing related systematic factors, we pay attention to a heuristic cue related to entrepreneurs' voice during pitching and investigate if voice cues influence the entrepreneurial pitching related outcomes. Human voice is a unique characteristic that carries socially relevant information about individual traits and personality (Belin, Bestelmeyer, Latinus, & Watson, 2011) and impacts personality judgements and interpersonal attraction (Oguchi & Kikuchi, 1997). Prior literature establish that voice provides cues for the speaker's first impressions, confidence levels, competence, dominance, trustworthiness, affective states, intelligence, credibility, and attitudes (Gelinas-Chebat & Chebat, 1992; Hodges-Simeon, Gaulin, & Puts, 2010; Mahrholz, Belin, & McAleer, 2018; Mayew & Venkatachalam, 2012; Scherer, London, & Wolf, 1973; Schirmer, Feng, Sen, & Penney,

2019). Voice is also important in business and influences marketing and hiring decisions as Farming (1990) notes that a weaker voice can ruin a first impression in business even if the speaker has good looks, fine clothes and stellar credentials. Voice characteristics have become so pivotal in today's platform-based digitalized era that even HR departments are now using voice profiling to analyze a candidate's voice to predict job fit (Chamorro-Premuzic & Adler, 2015).

A voice is deemed attractive when it is perceived as more beautiful or pleasant than other voices (Babel & McGuire, 2015). Social psychology research on vocal attractiveness focuses on understanding the impact of vocal attractiveness on peoples' perceptions and impressions and suggests that individuals with attractive voices are judged more favorably (McAleer, Todorov, & Belin, 2014; Zuckerman & Driver, 1989). The notion that vocal attractiveness has impactful outcomes for CEOs and entrepreneurs is not new—Tolley (1987) attributes the successful turnaround of Chrysler during the 1980s to Lee Iaccoca's strong and confident voice; Megginson (1986) suggests that Iaccoca's distinctive, pugnacious, and intense style of delivery in resonant, strong, and well-pitched voice created a sense of credibility and emotional connectedness among the listeners. DeGroot, Aime, Johnson, & Kluemper (2011) posit that vocal attractiveness is a part of the leader prototype so vocally attractive individuals are more likely to be judged as better leaders. They find that vocal attractiveness positively impacts perceived leader effectiveness, even after controlling for leaders' charisma, motivation, and intelligence. Also, Mayew, Parsons, & Venkatachalam (2013) posit that low vocal pitch in males signals important leadership traits. They show that male CEOs with deeper voice are better leaders, manage larger companies, earn more money, and have longer tenures. Even after accounting for experience, education, facial traits, and vocal formant positions of the sampled male CEOs, they find significant effect of vocal attractiveness measured using vocal pitch. Mayew & Venkatachalam (2012) show that vocal cues, which reflect CEOs' emotional states during conference calls, provide information to investors about firm's future profitability and stock returns.

While researchers in strategy and entrepreneurship have started to focus their attention on how voice cues impact various processes in the management and operation of firms, the effect of vocal attractiveness on investors' perceptions and preferences has not yet been investigated. This gap in research is salient because vocal attractiveness is important in creating attraction and affects perceptions about the communicator (Miyake & Zuckerman, 1993; Zuckerman & Driver, 1989; Zuckerman et al., 1990). Our objective in this article is to investigate the impact of vocal attractiveness in a crucial entrepreneurial context—entrepreneurs pitching their venture ideas to attract financial support from potential individual investors. Specifically, we examine whether and how vocal attractiveness impacts individual investors' information retention and attraction towards the venture in the context of new venture. As the way in which entrepreneurs communicate and seek resources from potential investors is critical for convincing the investors and securing finances from them (Bird & Schjoedt, 2009), entrepreneurial pitches are often delivered to give investors some ideas about the investment opportunity and aid investors' decision-making process at an early stage. Vocal attractiveness can be important for entrepreneurs as attractive voices can create more favorable perceptions of the entrepreneurs in investors' minds and impact investors' information processing (Imhof, Välikoski, Laukkanen, & Orlob, 2014). Hence, investigating the impact of vocal attractiveness in the context of entrepreneurial pitching is important and crucial as many investors now invest through crowdsourcing platforms where they just listen to entrepreneurial pitches and may not have a deep interpersonal relationship with the entrepreneur. Given the recent success of several crowdfunding platforms for raising seed capital, there is an emergent need to investigate the impact of vocal characteristics of entrepreneurs to understand why some entrepreneurs are more persuasive and perform better in negotiations than others.

We draw from the Heuristic Information Processing Theory (Chaiken, 1987) and Expectancy Violations Theory (EVT; Burgoon, 1993; Burgoon & Jones, 1976) to examine if listening to funding pitches in voices with different levels of vocal attractiveness influence investors' ability to retain information from the funding pitches

and level of attraction to the advocated business idea. Using heuristic information processing theory, we propose that voices can be a heuristic cue that investors use while making decisions in persuasive context. The core premise of heuristic information processing theory is that the individuals are more likely to rely on heuristic cues when such cues are easily accessible and available for decision making (Chaiken & Ledgerwood, 2011). Thus, voice, being an easily understood heuristic cue is easier to access and process when forming a judgement (Shah & Oppenheimer, 2008). Hence, we argue that while listening to entrepreneurial pitches, voices as heuristic cues indicate important personality attributes regarding the speakers that can influence investors' decision-making and information retention. As unattractive voices put higher cognitive demands on the listeners, we argue that investors are more likely to be persuaded and retain information from the elevator pitches when such pitches are delivered in attractive voices. Since attractive voices are prototype-like stimuli and evoke positive affective states and emotions, such voices are associated with favorable inter-personal attraction. So, we propose that attractive voices are processed more fluently and more efficiently than unattractive voices, that in turn leads to higher information retention and attraction towards the venture. Recent developments in message processing and persuasion research suggest that peoples' expectations have effects on the success or failure of different persuasive strategies. We thus incorporate investors' expectations in the heuristic information processing theory to suggest that investors' reactions and emotions towards the persuasive messages delivered through elevator pitches are affected when their expectations are negatively or positively violated during the pitch presentations. We tested these hypotheses in two laboratory experiments.

Our results suggest that vocal attractiveness has a significant positive effect on venture attraction. In addition, attractive voices make information retention easier than unattractive voices. Investors are more likely to retain more information from the presented elevator pitch and to feel attracted towards the venture when the elevator pitch is presented in an attractive voice than unattractive voice. We also find that attractive voices are easier to process and evoke positive affect, which in turn lead to increased

information retention and venture attraction. In addition, we find that the effect of vocal attractiveness on processing fluency and positive affect depends on whether investors' expectations regarding the entrepreneurs' voice are negatively or positively violated. The results suggest that the indirect effect of processing fluency and positive affect on venture attraction and information retention is indeed moderated by expectancy violations. Moreover, negative violations of expectations regarding the entrepreneurs' voice cues can lead to lower processing fluency and lower positive affect, which ultimately result in decreased information retention and venture attraction.

Our theoretical perspective and empirical findings offer significant contributions to knowledge about vocal attractiveness in the entrepreneurial context. Entrepreneurial funding pitches are crucial at the early stages for convincing the investors to support the entrepreneurs' new and burgeoning ventures (Clarke et al., 2018). Our research thus contributes to entrepreneurship pitching literature by suggesting that entrepreneurs' voice cues have significant impact regarding the success of the elevator pitch. Attracting funding for the startups are essential for the early-stage entrepreneurs (Drover et al., 2017; Jiang, Yin, & Liu, 2019) but entrepreneurs often find it too difficult to raise seed capital due to their liability of newness (Aldrich & Fiol, 1994) and their lack of legitimacy (Clarke et al., 2018), credibility (Jiang et al., 2019), administrative history, loyal customers, reputation for performance, and evidence of profitability (Brush, Greene, & Hart, 2001). Hence, it is essential to examine the factors that can assist entrepreneurs in delivering successful funding pitches and make them more successful in attracting support for their startups. Despite being an important phenomenon for early-stage entrepreneurs, the research surrounding entrepreneurial pitching is scant (see Appendix A for a review of entrepreneurial pitching literature). Most studies have so far focused on the attributes and qualities of the venture (Hoenig & Henkel, 2015; MacMillan, Siegel, & Narasimha, 1985), entrepreneurs' qualifications (Baum & Silverman, 2004; Bruns, Holland, Shepherd, & Wiklund, 2008; Hsu, 2007), entrepreneurs' positive affective feelings, preparedness, and passion (Baron, 2008; Cardon, Wincent, Singh, & Drnovsek, 2009), entrepreneurs' verbal and non-verbal

gesturing (Clarke et al., 2018) and display of positive affective emotions and passion during pitch presentations (Cardon, Mitteness, & Sudek, 2017; Chen, Yao, & Kotha, 2009; Jiang et al., 2019; Li, Chen, Kotha, & Fisher, 2017; Murnieks, Cardon, Sudek, White, & Brooks, 2016) for attracting financing supports for the startups. Yet, no study has investigated how attractiveness of the entrepreneurs' voice, the very contrivance that makes the funding pitch possible on the first place and has been found to be one of the most important factors to impact interpersonal judgments and attraction (Oguchi & Kikuchi, 1997). Our study is one of the first attempt to quantify the impact of entrepreneurs' vocal attractiveness on information retention and attracting venture support. In addition, the insights from this study can advance the literature on the heuristic information processing theory by assimilating a unique and shapeable human factor, i.e. voice and expectation violations. We provide evidence that entrepreneurs' voice is an important heuristic cue that investors incorporate while making decisions regarding an elevator pitch and investors react differently when their expectations reading the entrepreneurs' voice are negatively or positively violated.

## 2.2 Vocal Attractiveness

The seminal study by Dion, Berscheid, & Walster (1972) put forwarded the "what is beautiful is good" or the physical attractiveness stereotype which suggests that physically attractive males and females are assumed to have more socially desirable personality traits than physically unattractive individuals of both genders. This phenomenon of ascribing positive characteristics to attractive individuals is related to "halo effects" in which raters show a tendency to form an overall positive impression regarding a person based on one observable positive characteristic or trait (Goldman, Cowles, & Florez, 1983; Hughes & Miller, 2016; Nisbett & Wilson, 1977; Palmer & Peterson, 2016; Robbins, 1996; Thorndike, 1920). Halo effects occur because raters often fail to differentiate among conceptually distinct and potentially independent aspects of behaviors of the persons whom they are rating (Fisicaro & Vance, 1994; Hugh Feeley, 2002; Saal, Downey, & Lahey, 1980: 415). The attractiveness halo effects suggests that raters attach positive physical and personality traits to attractive

individuals and perceive them as more competent and intelligent (Berry, 1991; Moore, Filippou, & Perrett, 2011). Since then social psychology literature has found support for the purported halo effects of physical attractiveness which suggests that people have a tendency to attribute positive characteristics to attractive targets (Eagly, Ashmore, Makhijani, & Longo, 1991; Moore et al., 2011). Zuckerman and Driver (1989) applied the same concept in the voice domain to suggest "what sounds beautiful is good" or the vocal attractiveness stereotype. The vocal attractiveness stereotyping posited that attractive voices have profound effects on listeners and like attractive faces, attractive voices also evoke more favorable interpersonal impressions (Addington, 1971; Zuckerman & Driver, 1989; Zuckerman & Sinicropi, 2011) and have positive effects on interpersonal attraction, persuasion, and relationship building (Bruckert et al., 2010; Oguchi & Kikuchi, 1997; Oksenberg, Coleman, & Cannell, 1986). Subsequent studies have found support for such vocal attractiveness halo effects (Berry, 1990, 1992; Miyake & Zuckerman, 1993; Surawski & Ossoff, 2006; Zuckerman et al., 1990; Zuckerman, Miyake, & Hodgins, 1991) and vocal attractiveness has been found to have effects that are similar in magnitudes to the effects of physical attractiveness (Zuckerman & Sinicropi, 2011).

Just as raters can distinguish between attractive and unattractive faces and agree on which faces are attractive, they can do the same for voice as well (Surawski & Ossoff, 2006; Zuckerman & Driver, 1989; Zuckerman & Miyake, 1993). Human voice carries socially relevant information (Bestelmeyer et al., 2012; Fasoli, Maass, Paladino, & Sulpizio, 2017; Pinheiro, Lima, Albuquerque, Anikin, & Lima, 2019) and the highly sexually dimorphic acoustic features of human voice (Borkowska & Pawlowski, 2011; Puts, Hodges, Cardenas & Gaulin, 2007) convey important identify information such as gender, race, body mass, masculinity/femininity and provide perceptions regarding the physical attractiveness of unseen speakers (Collins & Missing, 2003; Pisanski, Mishra, & Rendall, 2012). Hence, in the mating context, the predominant view holds that an attractive voice signals desirable characteristics and attributes in a potential mate such as masculinity, dominance, and health or body size in case of men or youthfulness,

reproductive health, and mate quality in case of women (Bruckert et al., 2010; Bruckert, Liénard, Lacroix, Kreutzer, & Leboucher, 2005; Collins, 2000, 2000; Feinberg, 2008; Feinberg et al., 2006; Hughes, Dispenza, & Gallup, 2004; Xu, Lee, Wu, Liu, & Birkholz, 2013). However, in social and persuasive contexts, an attractive voice is defined as voice that is perceived as more beautiful or pleasant and is prototypical in nature (Babel & McGuire, 2015; Bruckert et al., 2010; Xu et al., 2013). Several acoustic features and subjective evaluations have been found to be associated with vocal attractiveness (Xu et al., 2013; Zuckerman & Miyake, 1993).

### 2.2.1 The Acoustic/Objective Features of Vocal Attractiveness

As voice carries several acoustic features, researchers have mainly focused on the acoustic features of "an attractive voice" (Babel & McGuire, 2015); however, there is little consensus regarding which acoustic features are best to define an attractive voice (Hughes & Miller, 2016). Prior researchers have consistently suggested fundamental frequency or vocal pitch as one of the key acoustic features of voice that influences listeners' assessments of gender, body size, masculinity/femininity, and attractiveness (Pisanski & Rendall, 2011). Several authors have found that men with lower-pitched voices are perceived as more attractive, physically stronger, and more dominant (Feinberg, Jones, Little, Burt, & Perrett, 2005; Liu & Xu, 2011). On the other hand, women with higher-pitched voices are perceived as more attractive, whereas lower-pitched female voices are perceived as more dominant, authoritative, and effective for leadership. (Anderson & Klofstad, 2012; Cartei, Bond, & Reby, 2014; Collins, 2000; Klofstad, 2016; Oguchi & Kikuchi, 1997; Puts, 2005; Puts, Gaulin, & Verdolini, 2006; Wolff & Puts, 2010; Zuckerman & Miyake, 1993). However, women with too high pitch are rated as babyish and immature (Borkowska & Pawlowski, 2011). Also, males with increased vocal tract length or lower formant dispersions are deemed to be larger in body size, more masculine, and older than those with decreased vocal tract length but vocal tract length has no significant effect on the assessments of vocal attractiveness (Feinberg et al., 2005).

Several other acoustic features of voice such as vocal loudness or amplitude, voice quality, amplitude intensity or variability and rate of speech in terms of syllable speed, duration of silence, and inter-phrase pauses also impacts listeners ratings of attractiveness judgements (Chattopadhyay, Dahl, Ritchie, & Shahin, 2003). Amplitude or vocal intensity is another key determinant of vocal attractiveness and indicates loudness and is measured in decibels (dB) using the Sound Pressure Level (SPL). The SPL demonstrates the strength of vocal fold vibration. Coleman, Mabis, & Hinson (1977) suggested that the minimum and maximum intensities in normal speakers should be between around 50 dB to around 115 dB. Also, males have slightly higher vocal intensities than females (Casper & Leonard, 2006; Coleman et al., 1977). Baken & Orlikoff (2000) and Baken, (1987) also posited that the minimum and maximum vocal intensities in everyday conversational speech have SPLs between 70 dB and 80 dB. As pointed out by Zuckerman & Driver (1989), an attractive voice has acoustic features that indicates confidence or lacks tensions. The acoustic features of a confident voice depict higher amplitude or vocal intensity, greater fundamental frequency or vocal pitch, and smaller between-sentence pause duration and listeners can attribute the speaker's level of confidence or doubtfulness by using these vocal cues (Scherer et al., 1973). Also, an attractive voice does not have the acoustic features that provide cues for the speakers' feelings of tension, nervousness, worry, anxiety, fear, and apprehension. Several acoustic features—higher fundamental frequency or vocal pitch, lower levels of loudness or vocal intensity and higher proportions of silence during speech reflects a nervous voice and listeners can appropriately perceive the levels of nervousness and tension in speakers' voices using these vocal cues (Laukka et al., 2008). So, amplitude or voice intensity and fundamental frequency or vocal pitch are important acoustic determinants of attractive voices (Babel, McGuire, & King, 2014).

Voice quality is another key acoustic features that signals speakers' affective states, personality traits, attitudes, mood and emotion during communication events and helps listeners to assign personality and affective attributes to speakers (Gobl & Chasaide, 2003; Scherer, 1978). Voice quality is measured by spectral tilt which

indicates the level of vocal efforts that a speaker produces during speech (Babel et al., 2014). Compared to lower values of spectral tilt, the higher values of spectral tilt demonstrate higher frequencies and relatively higher amplitude in voices. Voices with relatively higher spectral tilt is considered breathier while voices with relatively lower spectral tilt is considered creaky (Babel et al., 2014; Gordon & Ladefoged, 2001; Keating & Esposito, 2006; Klatt & Klatt, 1990; Sluijter & Van Heuven, 1996).

In addition to vocal pitch, amplitude, and vocal quality, prior research suggested that amplitude perturbation or variability or the variation in amplitude/loudness in a person's voice during connected speeches negatively affects vocal attractiveness as amplitude provide cues for negative emotion such as nervousness, fear, and anger (DeGroot, Aime, Johnson, & Kluemper, 2011; Frick, 1985). Amplitude variability also influences and results in negative subjective measurements and perceptions of vocal quality (Baken & Orlikoff, 2000). Measurement of amplitude perturbation or variability refers to small, rapid, cycle-to-cycle variations in the amplitude of human speech. Amplitude variability can be measured using shimmer (Baken & Orlikoff, 2000), directional perturbation factor (Hecker & Kreul, 1971), amplitude variability index (Deal & Emanuel, 1978), amplitude perturbation quotient (Maryn, Corthals, De Bodt, Van Cauwenberge, & Deliyski, 2009). Shimmer provides an indication of variability in amplitude and shimmery voices are perceived as breathier, unattractive, and hoarse (DeGroot et al., 2011; Dejonckere et al., 1996; Maryn et al., 2009). Also, voices that are jittery and have high harmonic-to-noise ratio are considered unattractive as jitter and harmonic-to-noise ratio indicates roughness, nervousness, abnormality, and deception in the speakers' voices (Mayew & Venkatachalam, 2012; Throckmorton, Mayew, Venkatachalam, & Collins, 2015). In addition to these acoustic features, speech rates, measured as number of words spoken per minute, are also associated with persuasiveness as fast speakers are perceived as more persuasive, knowledgeable, competent, intelligent, and objective (Miller, Maruyama, Beaber, & Valone, 2009; Smith, Brown, Strong, & Rencher, 1975). Also, listeners speech rate and gender impacts

their perceptions of speakers' competence and attractiveness (Feldstein, Dohm, & Crown, 2001).

The acoustic features of voice are important as these features carry cues regrading many relevant types of information. The human brain uses these cues to form voice perceptions to analyze and process information that the voice is conveying (Latinus & Belin, 2011). Several acoustic features of voice such as vocal pitch, variability in vocal pitch, and speech rate provides indications of competence and credibility—individuals with faster speech rate and who have higher variability in vocal pitch are viewed as more competent and credible (Addington, 1971; Brown, Strong, & Rencher, 1973; Ko, Judd, & Stapel, 2009; Smith et al., 1975). Also, voice femininity or high vocal pitch impacts listeners' judgements of competence—speakers with masculine voices (low vocal pitches) are deemed to be more competent than those with feminine voices (high vocal pitches) irrespective of speakers' genders and availability of competing background information about the speakers' behaviors and capabilities (Ko et al., 2009). Hence, lower-pitched voices are perceived to be more competent and dominant (Borkowska & Pawlowski, 2011; Jones, Feinberg, DeBruine, Little, & Vukovic, 2010) whereas voices that are too high-pitched are considered babyish (Borkowska & Pawlowski, 2011) and voice babyishness reduces the impact of voice femininity on competence (Ko et al., 2009).

### 2.2.2 The Subjective Features of Vocal Attractiveness

While the acoustic characteristics of voices provide an objective measurement or evaluation of vocal attractiveness, the subjective measurements of vocal attractiveness are also important. Subjective measurements of vocal attractiveness involves obtaining independent ratings of voice or vocal characteristics from judges or raters using adjective scales in terms of vocal pitch variations, loudness, breathiness, deepness, nasality, creakiness, throatiness, normal or modal, pressed, hoarseness etc. and these subjective measurements have been found to be correlated with the objective measurements (Zuckerman & Miyake, 1993). For example voices that are shimmery are considered breathier, voices that are jittery considered rough, and voices that have high

harmonic-to-mean ratio are considered hoarse (Babel et al., 2014; Dejonckere et al., 1996; Zuckerman & Miyake, 1993). Also, a modal or normal voice is slightly pressed and have regular fundamental frequencies or vocal pitches (around 140 Hz) and creaky voices have irregular and extremely low fundamental frequencies or vocal pitches (< 70 Hz) and are considered hesitant and informal (Gobl & Chasaide, 1992; Imhof et al., 2014; Laver, 1980; Lindestad, Södersten, Merker, & Granqvist, 2001; Yuasa, 2010). Like acoustic features, subjective features of voice also provide cues for attractiveness, competence, and credibility. Prior research has also presented evidence on raters' agreement regarding the breathiness of female voices when compared to male voices (Henton & Bladon, 1985) and suggested that females with breathier voices are deemed to be more attractiveness than females with pressed voices (Liu & Xu, 2011). However, breathier female voices are less perceptible and intelligible, and women were found to employ breathier voices to make themselves more desirable to men in mating contexts (Henton & Bladon, 1985). In addition, breathy voices are deemed moderately competent and dynamic but less credible than normal voice while pompous voices are deemed more competent but less credible than breathy voices (Addington, 1971). Subjective measurements or evaluations of voice are essential as these indicate the level of attention a vocal communication demands and have been found to account for a substantial proportion of variance in vocal attractiveness (Zuckerman & Miyake, 1993).

## 2.3 Theory & Hypotheses

### 2.3.1 The Effect of Vocal Attractiveness on Venture Attraction and Information Retention

As investment in entrepreneurial ventures is a persuasion process (Chen et al., 2009), entrepreneurs attempt to change investors' attitude and subsequent behaviors by communicating persuasive information through the funding pitches. Dual-process theories (Chaiken & Trope, 1999; Gawronski & Creighton, 2013) suggest that the processing of persuasive messages can occur through either controlled processing of the message arguments or automatic processing of the heuristic cues. Specifically, the elaboration likelihood model (ELM; Petty & Cacioppo, 1986) suggests that there are

two distinct routes to persuasion— a central route wherein individuals thoroughly and carefully assess all the issue-relevant arguments provided in the message, or a peripheral route wherein individuals rely on heuristic cues such as an attractive source without scrutinizing the quality of the message arguments. The peripheral route to persuasion requires less effortful processing of the information provided in the persuasive message, as such, entails less cognitive efforts (Bhattacherjee & Sanford, 2006). Similar to ELM, the heuristic-systematic model of information processing (HSM; Chaiken, 1980, 1987; Chaiken, Liberman, & Eagly, 1989; Chen & Chaiken, 1999) suggests that information provided in the persuasive message is processed through two distinct modes— systematic processing in which individuals try to understand all the information through deep and attentive thinking, or heuristic processing in which individuals access easily noticed and understood cues to form judgments. Heuristic processing involves less cognitive resources as it relies on heuristic cues that are easily activated and available decision rules (Chaiken & Ledgerwood, 2011).

While these dual-process theories of persuasion demarcate the two aspects of a persuasive message, the unimodel theory of persuasion (Kruglanski & Thompson, 1999) argues that persuasion occurs through a single route and both heuristic cues and message arguments are functionally equivalent to the persuasion process. Decision-makers use both heuristic and systematic cues to reach a decision and use a certain cue only if they view that cue to be important for their decision-making. Prior research has documented that investors use both heuristic and message cues: investors systemically assess entrepreneurial ventures by evaluating and screening the business plans or investment opportunities to ascertain the expected returns and risks, long-term profitability, growth, financial and marketing perspectives of the new ventures and heuristically judge the background, characteristics, or personality of the entrepreneurs and the composition of entrepreneurial team (Hall & Hofer, 1993; Kaplan & Stromberg, 2001; Kollmann & Kuckertz, 2010; Monika & Sharma, 2015). Also, MacMillan, Siegel, & Narasimha (1985:119) suggested that personality and experience of the entrepreneurs matters most to the VCs while making investment decisions because business plans are

"necessary but not sufficient" and business plans also needs to portray that the entrepreneurs is a better fit to run the business to secure funding from VCs. In addition, Muzyka, Birley, & Leleux (1996) suggested that European VCs ranked the entrepreneur and his team as more important factors than the product-market criteria. Hence, we concur with the unimodel theory of persuasion in propounding that heuristic cues and message arguments are functionally equivalent for decision-making. So, individual and institutional investors often undergo heuristic processing based on heuristic cues related to the entrepreneurs (likability, communication skills, and attractiveness of the communicator) and make decisions that are biased, overconfident, and conforming to their past beliefs and experiences (Monika & Sharma, 2015; Shepherd, Zacharakis, & Baron, 2003; Zacharakis & Shepherd, 2001). Also, VCs tend to prefer ventures with entrepreneurs who think like them (Murnieks, Haynie, Wiltbank, & Harting, 2011) and teams that are similar to them in terms of training and experience (Franke, Gruber, Harhoff, & Henkel, 2006). In addition, BAs tend to invest in ventures that are run by entrepreneurs with whom they would like to spend time (Haines Jr, Madill, & Riding, 2003) and are also found to focus less on calculating IRRs, rely more on instincts, and conduct less extensive due diligence than VCs (Sudek, 2006). Moreover, both experienced and novice BAs are found to use heuristic cues and rely on past memories while making investment decisions (Harrison, Mason, & Smith, 2015; Mason, Smith, & Harrison, 2010).

In additions to VCs and BAs, entrepreneurs can request funding from a group of investors or crowd by providing a pitch on the crowdfunding platform or website (Griffin, 2012). Crowdfunding has become a popular investment opportunity (Tomczak & Brem, 2013) and investors can invest in projects after listening to the entrepreneurial pitch or watching videos on the online platforms (Mitra, 2012). Prior researchers suggested that not all projects are successfully backed by the crowds (An, Quercia, & Crowcroft, 2014) and social network size and preparedness of the entrepreneurs in terms of availability of videos of pitches, project updates, and spelling errors impact project success (Mollick, 2014). As individual investors who invest in crowdsourcing projects

through online platforms without having met the entrepreneurs in person or developing a close bond with the entrepreneurs like VCs or angels (Mollick, 2013), it is more likely that these individual investors may form an opinion based on heuristic processing. Accordingly, Ferran & Watts (2008) found that participants who attended a seminar through videoconferencing rely more on the heuristic cues, i.e. speaker's likability when processing new information than those who attended the seminar face-to-face. As investors extensively use heuristic cues, we believe that entrepreneurs' voice during funding pitch delivery can be an important cue in the persuasion process that has been ignored in the entrepreneurial pitching literature.

We propose that entrepreneurs' voice, being a unique characteristic, may serve as a heuristic cue because voices are easily noticeable and automatically accessible cues. So, entrepreneurs' vocal attractiveness can influence investors' processing of the information contained in the funding pitches. The heuristic processing theory suggests that individuals are more likely to rely on heuristic cues and perform less effortful information processing when they face higher cognitive demand and have less cognitive resources available to process information contained in the persuasive messages (Chaiken & Ledgerwood, 2011; Chen & Chaiken, 1999; Ferran & Watts, 2008). As working memory organize, select, and integrate information before processing the information, listening speeches like entrepreneurial pitches challenges working memory (Imhof et al., 2014). Working memory limitations impede listening, information processing and subsequent decision-making (Beaman, 2004) because listeners need to process both verbal and nonverbal information carried by speakers' voice. Imhof et al. (2014) suggest that attractive voices put less cognitive and listening loads on listeners because attractive voices positively influence peoples' perceptions about the speaker and evoke favorable emotional responses during interpersonal communication. Also, the acoustic features of attractive voices put low extraneous loads on the working memory, and thus listeners are required to spend less cognitive resources to process information delivered through attractive voices, which in turn enhances listeners ability to retain information (Imhof et al., 2014; Janusik, 2005). As listening to unattractive

voices consumes more cognitive capacity and puts higher cognitive demands on individuals' working memory (Imhof et al., 2014; Janusik, 2005), we propose that investors are more likely to retain information from the funding pitches when entrepreneurs speak in an attractive voice compared to unattractive voices.

Entrepreneurs' vocal attractiveness can also impact the effectiveness and persuasive appeals of the funding pitch, therefore influence how investors perceive the entrepreneurs and affect investors' decisions. Individuals are often persuaded or agree with messages after they make assessments of persuasion cues based on the characteristics of the source or communicator such as credibility, expertise, physical attractiveness, likability, and similarity (Chaiken, 1979, 1980, 1987; Chaiken & Eagly, 1983; Kang & Herr, 2006). Hence, we propose that investors are more likely to be persuaded and feel attracted towards the venture when entrepreneurs speak in an attractive voice compared to unattractive voices. This is because raters perceive attractive individuals as more intelligent and attach positive physical and personality traits to them (Berry, 1991; Moore et al., 2011). In addition, voices in the attractive range have been linked positively with several positive personality traits of the speakers and listeners tend to assign high performance and credibility ratings to vocally attractive individuals and perceive them as effective leaders than vocally unattractive individuals (DeGroot et al., 2011). Hence, we argue that investors are more likely to remember information provided in the funding pitch and prefer ventures pitched by entrepreneurs with attractive voices than unattractive voices. Accordingly, we hypothesize—

**H1a:** *Unattractive (Attractive) voice of an entrepreneur leads to a lower (greater) likelihood that investors will find the venture attractive.*

**H1b:** *Unattractive (Attractive) voice of an entrepreneur leads to a lower (greater) likelihood that investors will retain information from the elevator pitch.*

### 2.3.2 The Mediating Effect of Processing Fluency and Positive Affect

Individuals prefer attractive stimuli because such stimuli are familiar to their prototypes (Apicella, Feinberg, & Marlowe, 2007; Bronstad, Langlois, & Russell, 2008; Langlois et al., 1987; Langlois, Roggman, & Musselman, 1994; Langlois & Roggman, 1990; Little, Apicella, & Marlowe, 2007; Potter & Corneille, 2008; Rhodes & Tremewan, 1996; Rubenstein, Kalakanis, & Langlois, 1999). Preferences for prototypes are not new—several studies suggest that individuals report preferences for prototypical dot patters (Bomba & Siqueland, 1983; Posner & Keele, 1968; Reber, Stark, & Squire, 1998; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006), colors (Martindale & Moore, 1988), birds, fishes, and cars (Halberstadt & Rhodes, 2003). Also, several researchers argue that the preference for prototypes arises from the cognitive bias for prototype-like stimuli that has been observed for both biological and nonbiological objects (Halberstadt & Rhodes, 2000; Langlois & Roggman, 1990; Rubenstein et al., 1999). Such cognitive bias arises because of the uniqueness and representativeness of the prototypical stimuli (Bruckert et al., 2010; Rubenstein et al., 1999). Similarly, several researchers argue that the preference for attractive faces or voices is driven by the cognitive bias (Bruckert et al., 2010; Langlois & Roggman, 1990; Rubenstein et al., 1999). Attractive faces are indeed prototypical and thus deemed more attractive by the raters (Potter & Corneille, 2008). Applying the same theoretical reasoning, Bruckert et al. (2010) and Xu et al. (2013) suggested that attractive voices are prototype-like stimuli.

Individuals' preference and favorable evaluation of prototypes are influenced by the associated processing dynamics as prototypical stimuli are processed more fluently, rapidly, easily, and efficiently than other stimuli (Komatsu, 1992; Posner & Keele, 1968; Reed, 1972; Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976; Trujillo, Jankowitsch, & Langlois, 2014; Winkielman et al., 2006). In addition, prototypes are easier to process and comprehend because individuals are more familiar and have experience with the features of objects that are prototypical in nature (Principe & Langlois, 2012; Reber, Schwarz, & Winkielman, 2004). Also, prototypes evoke positive affective responses when such stimuli are judged on positive dimensions (Harmon-

Jones & Allen, 2001; Principe & Langlois, 2011, 2012, 2012; Trujillo et al., 2014; Winkielman & Cacioppo, 2001; Winkielman et al., 2006). Because of familiarity and experience, prototypes are processed more fluently by raters and such fluent processing is normally error-free and demonstrates successful recognition of stimuli (Phaf & Rotteveel, 2005; Trujillo et al., 2014; Winkielman et al., 2006). Also, such fluent processing positively influences the raters' aesthetic judgements and evoke more favorable judgements and positive reactions to the stimuli (Babel & McGuire, 2015; Winkielman et al., 2006; Winkielman, Schwarz, Fazendeiro, & Reber, 2003). As prototypical stimuli are processed fluently (Winkielman et al., 2006), hence, conceivably attractive voices can be processed fluently with greater speed and more efficiently than unattractive voices. Hence, we suggest that attractive voices can be processed more fluently and are positively favored by the listeners because of the cognitive bias towards the prototype-like stimuli. Also, as attractive voices are perceived more favorably and evoke positive evaluations of the speakers, such voices lead to positive affective responses and emotions in listeners. Thus, venture ideas pitched by entrepreneurs with attractive voices elicit positive affect and are easier to process by investors who listen to such pitches.

Attractive voices evoke positive affect among the listeners, and such positive affect also helps information processing[1] and retention of information (Ashby, Valentin, & Turken, 2002; Bless et al., 1996; Broekens, Kosters, & Verbeek, 2007; Carretié, Hinojosa, & Mercado, 2003; Cornew, Carver, & Love, 2009; Dienes, 1996; Forgas, 2000; Phaf & Rotteveel, 2005; Smith, Cacioppo, Larsen, & Chartrand, 2003; Wyer Jr, Clore, & Isbell, 1999). Positive affect also leads to increased use of stereotyping

[1] While some studies suggest that positive affect impair or hinder decision-making and information processing (Bless, Bohner, Schwarz, & Strack, 1990; Mackie & Worth, 1989; Melton, 1995), Isen (2008) suggests that such findings were observed under specific conditions and majority of the studies found that positive affect facilitates thinking and cognitive processing. She also argues that there is no compelling evidence that positive affect promotes superficial processing rather positive affect allows individuals to use both simplifying devices and systematic processing which makes information processing more efficient and thorough. Bodenhausen et al. (2001) also support this notion and argue that positive affect allow flexibility in information processing strategies.

(Bodenhausen, Kramer, & Süsser, 1994) which saves mental energy and thus simplify information retention and generation of responses (Andersen, Klatzky, & Murray, 1990; Bodenhausen & Lichtenstein, 1987; Macrae, Milne, & Bodenhausen, 1994). In addition, positive affect results in cognitive processing that is efficient, systematic, careful, thorough, flexible, innovative, and creative and reflects more flexible information processing strategies, enhanced thinking, creative problem-solving, and efficient negotiation and decision-making (Ashby, Isen, & Turken, 1999; Bodenhausen, Mussweiler, Gabriel, & Moreno, 2001; Carnevale & Isen, 1986; Isen, 1984, 1993, 2001, 2008; Isen & Means, 1983; Isen, Rosenzweig, & Young, 1991). Moreover, positive affect improves episodic memory and eases recall of both neural and positive information (Ashby et al., 1999, 2002; Isen, Shalker, Clark, & Karp, 1978; Nasby & Yando, 1982; Teasdale & Fogarty, 1979). Furthermore, positive affect facilitates controlled processing, improves cognitive flexibility and working memory to facilitate information retention (Broekens et al., 2007; Yang, Yang, & Isen, 2013).Therefore, we argue that attractive voices are processed more fluently and invoke positive affect among potential investors which leads to a greater likelihood that investors will retain the information presented in the funding pitch and are more likely to find the investment opportunity attractive. Accordingly, we propose—

> **H2a & 2b:** *Information processing fluency partially mediates the effect of vocal attractiveness on venture attraction and information retention.*

> **H2c & 2d:** *Positive affect partially mediates the effect of vocal attractiveness on venture attraction and information retention.*

### 2.3.3 The Moderating Effect of Expectancy Violations

As voice helps to form perceptions and impressions, listeners have expectations regarding speaker's verbal and non-verbal behaviors during communication events (Burgoon, 1993; Burgoon & Jones, 1976). Expectations refer to the anticipation of upcoming events or information based on past and current experiences and beliefs (Schmuckler, 1997). Researchers have also suggested that people have harmonic

expectations regarding voice and violating harmonically expected events lead to emotional effects and decrease memory (Bharucha & Stoeckig, 1986; Steinbeis, Koelsch, & Sloboda, 2005). Expectations serve as framing devices (Burgoon, 1993; Goffman, 1974) and are the main factor in forming peoples' perceptions and such perceptions form the basis of subsequent behavior and choices. As suggested by social psychology literature, voices impact perceptions about the speakers and attractive voices even create more favorable perceptions and impressions (Berry, 1990; Zuckerman et al., 1991). As such listening to voices that sound annoying or violate the communication- and norm-based notions of the listeners can lead to negative opinions and evaluations about the speaker. We propose that listening to voices that are contrary to expectations can influence outcomes and choices of persuasive communications as listeners' processing of information provided in the message and emotional reactions will differ depending on whether their expectations were violated. The support for this comes from the EVT (Burgoon, 1993, 2015; Burgoon & Jones, 1976) which argues that when norm and belief-driven expectations are not met, individuals can be physiologically and psychologically aroused, distracted and react differently to the same message because of violations of expectations. High levels of arousal or alertness or activation lead to attention selectivity, impact task performance, and disrupt information processing, especially for complex tasks (Berlyne, 1960; Easterbrook, 1959; Zajonc, 1965). In addition, high arousal levels reduce the listeners' information processing capacities on a persuasive message because high arousal levels put capacity limitations on individuals (Eysenck, 2012), which in turn impact listeners' attitudes and persuasiveness (Sanbonmatsu & Kardes, 1988). This is because when individuals are distracted and aroused due to violations of their expectations, they need to redirect attentional resources from what is being said in a persuasive message towards the violations. Listeners divert their attention from task-related stimuli to non-task related efforts to process violations. Hence, listening to voices that violates listeners' expectations can influence the emotional reactions and hamper how fluently the message is processed by the listeners.

EVT differs from existing theories of expectations as it differentiates between positive violations, confirmations and negative violations. Burgoon (1993, 2015) suggests that violating expectations lead to better communication outcomes—attraction, learning, persuasion, credibility than doing what is expected as long as such violations evoke positive reactions among the perceivers. On the other hand, negative violations lead to worse communication outcomes than doing what is expected as such negative violations create uncertainty. As attractive voices have been associated with high interpersonal attraction and high personality ratings and unattractive voices are associated with less credibility and interpersonal attraction, the effect of vocal attractiveness on processing fluency and positive affect may depend on if and how listeners' expectations are violated. We theorize that a priori all investors expect to listen to a modal or normal conversational voice that is most frequently used in speech. Hence, unexpectedly listening to attractive voices during an elevator pitch serves as a positive violation for the listeners which can strengthen the effect of vocal attractiveness on processing fluency and positive affect. On the other hand, unexpectedly listening to unattractive voices during an elevator pitch serves as a negative violation which can further dampens the effect of unattractive voice on processing fluency and evoke negative reactions. Accordingly, we propose—

**H3a:** *Expectancy violations moderates the strength of the indirect effect of vocal attractiveness on information processing fluency, such that negatively (positively) violated expectations lead to slower (faster) information processing fluency when the voice is unattractive (attractive).*

**H3b:** *Expectancy violations moderates the strength of the indirect effect of vocal attractiveness on positive affect, such that negatively (positively) violated expectations lead to lower (greater) positive affect when the voice is unattractive (attractive).*

## 2.4 Study 1

### 2.4.1 Overview of Study 1

Our hypothesized dual path moderated-mediation model is presented in Figure 2.1 and we conduct Study 1 to test the outlined predictions and research model.

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Insert Figure 2.1 about here

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The purpose of study 1 is to test whether entrepreneurs' vocal attractiveness has significant effect on investors' information retention and attraction towards the venture. In addition, study 1 is used to provide validity to the vocal attractiveness manipulation.

### 2.4.2 Participants

77 students who were familiar with entrepreneurial project and investment decisions were recruited from a US university to participate in the study. The students were completing an entrepreneurial project at the time, so they were aware of the purposes and importance of elevator pitches. Participants were an average of 20 years old and 53% of the participants were male.

### 2.4.3 Research Design

We employ a single factor between-subjects experimental design to test the impact of vocal attractiveness on venture attraction and information retention. The 77 students were randomly assigned to one of the three experimental conditions and each participant listened to the elevator pitch with varying degrees of vocal attractiveness rated as unattractive, neutral/normal, and attractive under identical testing conditions. The content of the elevator pitch is held constant across all the conditions. After listening to the elevator pitch, participants completed the survey. Participants were also instructed not to adjust the volume of the elevator pitch while listening to keep the testing conditions identical.

### 2.4.4 Materials and Procedures

The experiment was administered via Qualtrics. Before starting the study, all participants were made aware that the data is being collected only for research purposes and were assured that their responses will be kept confidential. In return for their participation, subjects were awarded extra credit. After providing consent to the study, participants were randomly assigned to listen to one version of the same elevator pitch with manipulated levels of vocal attractiveness. The elevator pitch was collected from an actual Kickstarter campaign and the entrepreneur was female. The content was kept same across three conditions. Participants were provided only with the audio of the elevator pitch, presented by a female speaker and they were not told about the gender of the presenter. Participants were instructed to start the audio by clicking a button on the Qualtrics webpage. Participants were required to remain on the page that contained the audio for the entire duration of the pitch, as the Qualtrics questionnaire became available only after the completion of the pitch. After listening to the elevator pitch, participants completed the survey items. Participants were required to answer all questions in each section and were not allowed to return to a previous section after its completion. Participants were also instructed not to adjust the volume of the audio presented to them by altering the volume of the headphones or computer.

### 2.4.5 Manipulation of Vocal Attractiveness

In this study, we manipulate several acoustic features of vocal characteristics to create pitches with varying degrees of vocal attractiveness. We use voice morphing software (Praat and Audacity) to manipulate several key stable and well-researched vocal cues that has been consistently used in psychology literature to define vocal attractiveness in interconnected or continuing speech and are found to influence perceptions of desired leadership characteristics—pitch, pitch variability, amplitude, pauses, and speech rate— to generate voices ranging from attractive to unattractive (DeGroot et al., 2011; DeGroot & Motowidlo, 1999). Using the voices with varying level of attractiveness, we investigate if listening to unattractive voices compared to

attractive voices impedes or facilitates information processing and attraction towards the venture. In study 1, we manipulate the above-mentioned acoustic cues of a female presenter to test our hypothesized model. The details of the manipulation of vocal attractiveness is presented in Appendix B.

### 2.4.6 Measures

#### *2.4.6.1 Dependent Variables*

##### *2.4.6.1.1 Information Retention*

We measure information retention following Imhof et al., 2014. Participants were asked and answered five specific questions related to the pitch. Information retention is measured by dividing the number of correct answers by total number of questions. This provides a measure of how much information the participants retained from the elevator pitch.

##### *2.4.6.1.2 Venture Attraction*

As Clarke et al., (2018) suggested that investors adjudge it unrealistic to make a yes-no investment decision based solely on the pitch presented by the entrepreneur. Rather they view entrepreneurial funding decisions as staged process with multiple steps before any yes-no investment decisions can be made. So, Clarke et al., (2018) reported that the purpose of the pitch is to make sure that the entrepreneur is progressing in this process, but the pitch does not conclusively ensure that the entrepreneur has secured a concrete investment decision. Hence, we focus on whether the investors feel attracted towards the venture after listening to the elevator pitches. Instead of using a binary yes-no outcome for measuring investors' venture attraction we ask participants to rate the level of attraction that they felt towards the venture using a 5-item Likert scale, ranging from 1= *extremely unattractive* to 5= *extremely attractive*. This is because Clarke et al., (2018) suggested that a binary yes-no outcome variable may not be able to capture the nuances of potential investors' intentions and decisions. The participants were also asked to write the single most important factor in support of their decision.

### *2.4.6.2 Mediating and Moderating Variables*

#### *2.4.6.2.1 Processing Fluency*

To measure processing fluency, participants were asked how easy or difficult it felt to understand the content of the elevator pitch (1 = *very difficult*, 7 = *very easy*). The measure is consistent with previous research on processing fluency and captures participants' subjective feelings regarding the elevator pitch (Rennekamp, 2012).

#### *2.4.6.2.2 Positive Affect*

State positive affect (PA) was assessed using the 5-item shorted version Positive Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The 5 items used for PA were: "enthusiastic," "attentive," "proud," "interested," "inspired" following Foo, Uy, & Baron (2009) and participants were asked to report their current feelings on each of the five dimensions using a 5-point scale, ranging from 1 = *not at all* to 5 = *extremely*. Responses were averaged to generate an overall measure of investors' positive affective reactions. The reliability coefficient alpha for the positive affect scale is 0.87.

#### *2.4.6.2.3 Expectancy Violations*

To assess whether participants' expectations regarding voice were violated, we adopted the measure developed by Livingston, Schilpzand, & Erez (2017). Participants indicated whether the speaker's voice violated their expectations using a Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The scale included the following items: "I was surprised to hear the speaker's voice in the elevator pitch I listened to", "I did not expect to hear this voice in the elevator pitch", "I didn't notice the voice of the speaker in the elevator pitch (r)", "The speaker's voice was unexpected to me", "The voice of the speaker was what I expected it to be (r)". We also added several more general items about whether the content of the elevator pitch violated their overall expectations following Livingston et al., (2017): "The elevator pitch was presented as I expected it to be presented (r)", "The elevator pitch contained all the information that I expected (r)", and "the elevator pitch didn't live up to my expectations". The Cronbach's alpha estimate for the entire scale was 0.88.

*2.4.6.3 Controls*

Participants also completed surveys indicating their age and gender, perceived passion and preparedness of the entrepreneur. Participants also indicated if they have any hearing impediment and provided ratings for vocal attractiveness of the entrepreneur and indicated their familiarity with the proposed venture.

### 2.4.7 Results

*2.4.7.1 Manipulation Checks*

Responses to the manipulation-check questions indicate that all manipulations were successful. None of the participants reported having any hearing impediment. Ninety-eight percent (100 percent) of the participants in the unattractive VA condition correctly indicate that they find the voice of the presenter unattractive (attractive). Also, ninety-nine percent of the participants correctly identified the gender of the presenter. Excluding the participants who failed this manipulation-check question does not affect the results. Therefore, analyses include these participants. To further determine the effectiveness of the manipulation of vocal attractiveness, a one-way analysis of variance (ANOVA) was performed on the ratings of the vocal attractiveness. The results suggest that the group who perceived the entrepreneur's voice as attractive reported higher venture attraction than the group who perceived the entrepreneur's voice as unattractive. So, results indicated a significant main effect of vocal attractiveness ratings on venture attraction ($F(2, 74) = 13.15$, $p = 0.0000$, $\eta_p^2 = 0.26$). Also, the results indicated a significant main effect of vocal attractiveness ratings on information retention ($F(2, 74) = 4.38$, $p = 0.0159$, $\eta_p^2 = 0.11$). Therefore, our manipulation of vocal attractiveness was effective. We also asked participants to indicate if they thought that the voice that they heard was mechanical or computer generated. None of the subjects indicated that they felt the voice was mechanical. To ensure that participants were actually expecting to hear normal voice and their expectations were violated, we compare the mean expectancy violations across three VA groups. We found that the mean expectancy violations across the three groups is significantly different ($F = 3.69$, $p = 0.0259$) and

the mean comparison suggests that the mean expectancy violations is lowest and significant when participants heard the normal voice than when they heard attractive or unattractive voice. Means, standard deviations, and intercorrelations between the study variables are presented in Table 2.1. To assess the degree of multicollinearity, we computed the variance inflation factor (VIF) of each independent variable and found that all the VIFs were less than 2, which is far below than the threshold VIF level of 4 (Hair, Black, Babin, Anderson, & Tatham, 1998), indicating that our model estimations do not suffer from a multicollinearity bias.

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Insert Table 2.1 about here

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*2.4.7.2 Hypothesis Tests*

*2.4.7.2.1 Effect of Vocal Attractiveness on Venture Attraction*

H1a predicts that investors are more likely to feel attracted towards the venture when the elevator pitch is presented in an attractive voice. To test for the H1a, we run ANCOVA with venture attraction as the dependent variable (see Table 2.2). Average venture attraction ratings and ANCOVA results are presented Panel A and B of Table 2.2, respectively.

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Insert Table 2.2 about here

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We find that there is a significant effect of vocal attractiveness on venture attraction ($F = 12.23$, $p < 0.001$). To compare the differences between groups, we conducted planned comparisons among the groups (see Panel C, Table 2). The results suggest that the mean venture attraction of participants in the attractive voice condition is significantly higher than the venture attraction of participants in the unattractive voice condition ($F = 23.44$, $p < 0.001$). Thus, H1a is supported as participants who listened to the elevator pitch in an attractive voice indicated higher venture attraction than participants who listened to the elevator pitch in an unattractive voice.

Hypothesis 2a proposes that processing fluency partially mediates the effect of vocal attractiveness on venture attraction and H3a proposes that expectancy violations moderates the effect of vocal attractiveness on information processing. To test for these hypotheses, we follow a bootstrapping approach for moderated mediation effects (Hayes, 2017). We estimated the direct and indirect effects, moderated by expectation violations from vocal attractiveness through processing fluency to venture attraction using random sample drawn 10,000 times from the data set. Results of these analyses are presented in Table 2.3.

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Insert Table 2.3 about here

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As shown in Panel A of Table 2.3, we find a positive and significant relationship between vocal attractiveness and processing fluency and between assessments of processing fluency and venture attraction. The results suggest that compared to unattractive voices, listening to normal ($\beta$ =0.6568, $p$=0.0003) and attractive ($\beta$ =2.0727, $p$=0.0000) voices significantly increases processing fluency and procesing fluency significantly increases venture attraction ($\beta$ =0.1490, $p$=0.0091). Also, expectancy violations moderates the effect of vocal attractiveness on processing fluency when the voice is normal compared to unattractive ($\beta$ = 0.8925, $p$=0.0190) and when voice is attractive compared to unattractive ($\beta$ = 0.9012, $p$=0.0248), suggesting that participants whose expectations were either confirmed or positively violated were more likely to indicate higher processing fluency than participants whose expectations were negatively violated. These interactive effects are plotted in Figure 2.2 which shows the effects of attractive, normal, and unattarctive voices on processing fluency at low (−1 SD) or high (+1 SD) levels of positive and negative expectancy violations.

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Insert Figure 2.2 about here

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Figure 2.2 shows that compared to normal and unattractive voices, listening to attractive vocies result in high levels of processing fluency. However, the mean processing fluency declines as expectations are violated but the mean processing fluency for the attractive voice group does not decline as much as they do when participants heard unattractive voices. Compared to unattractive voices, the lines become flatter when participants heard normal and attractive voices. This suggests that mean processing fluency declines significantly when expectations are negatively violated but the decline is less when expectations are positively violated. So, the positive effect of attarctive voices on processing fluency will be stronger if expectations are not negatively violated. The simple slope analyses (Aiken, West, & Reno, 1991) showed that compared to unattractive voice, the effect of attractive voice on processing fluency is significant at both high (b =2.7572, *p*= 0.0000) and low (b =1.6909, *p*= 0.0000) levels of positive expectation violations. Hence, compared to negatively violating expectations, there is a signifcant positive effect of positively violating expectations at both high and low levels of positive expectancy violations. In addition, compared to unattractive voice, for normal voice this effect is significant only at high (b =1.2639, *p*= 0.0000) but not at low (b =0.1246, *p*= 0.7020) levels of expectancy violations. Hence, at low levels of expectancy violations, there is no signifcant difference between negatively violating or barely confirming expectations.

The inspection of bootstrapped bias-corrected confidence intervals for the analysis of indirect effects (see Panel B, Table 2.3) confirms the hypothesized mediation.[2] Conditional indirect effects and the index of moderated mediation are presented in Panel C and D of Table 2.3, respectively. The results of Panel C and D combindly suggest that compared to unattractive voices, processing fluency mediates the relationship between normal voice and venture attraction and such indirect effects are moderated by expectation violations (Index= 0.1330, 95% CI= 0.0049, 0.3475).

[2] The analysis of bootstrap confidence interval does not include zero which denotes statistical significance (Hayes 2017).

Similarly, compared to unattractive voices, processing fluency mediates the relationship between attractive voice and venture attraction and such indirect effects are moderated by expectation violations (Index= 0.1343, 95% CI= 0.0143, 0.3364).

Hypothesis H2c proposes that positive affect partially mediates the effect of vocal attractiveness on venture attraction and H3b proposes that expectancy violations moderates the effect of vocal attractiveness on positive affect. To test for these hypotheses, we follow the same procedure to estimate the bootstrapped bias-corrected confidence intervals for the indirect effects (Hayes, 2017). Results of these analyses are presented in Table 2.4.

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Insert Table 2.4 about here

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As shown in Panel A of Table 2.4, we find that compared to unattractive voices, listening to normal (β =0.3389, *p*=0.0732) and attractive (β =0.5575, *p*=0.0024) voices significantly increases positive affect and positive affect significantly increases venture attraction (β =0.3146, *p*=0.0000). In addition, expectancy violations moderates the effects of vocal attractiveness on positive affect only when the voice is attractive compared to unattractive (β = 0.7647, *p*=0.0302). Expectancy violations do not moderate the effects of vocal attractiveness on positive affect when voice is normal compared to unattractive (β = 0.4626, *p*=0.2156). We plot the interactive effects in Figure 3 which shows the effects of attractive, normal and unattractive voices on positive affect at low (−1 SD) or high (+1 SD) levels of positive and negative expectancy violations.

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Insert Figure 2.3 about here

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The plot shows that positive affect for the participants in the attractive voice condition is higher than the participants in the unattractive and normal voice conditions. As expectations are violated, positive affect starts to decline but the decline is less

prominent for participants who heard the entrepreneur with an attractive voice compared to the participants who heard the entrepreneur with an unattractive voice. Compared to the participants in attractive and normal voice conditions, the line becomes steeper as expectations are violated for the participants in unattractive voice condition, thus suggesting that mean positive affect significantly declines when expectations are negatively violated. Compared to participants in unattractive voice condition, the line becomes more flatter as expectations are violated for participants in attractive voice condition, thus suggesting that mean positive affect does not decline as much as they do when expectations are negatively violated. From the simple slope analyses (Aiken et al., 1991) we find that compared to unattractive voice, this effect of attractive voice on positive affect is significant only at high (b =0.9664, $p$= 0.0004) but not at low (b =0.1486, $p$= 0.5617) levels of positive expectancy violations.

From the inspection bootstrapped bias-corrected confidence interval for the indirect effect (Panel B Table 2.4; 10000 bootstrapped iterations), we find that positive affect partially mediates the relationship between vocal attractiveness on venture attration. Panel C and D of Table 2.4 provides the conditional indirect effects and the index of moderated mediation, respectively. The moderated mediation index ($z$ = 0.2406, 95% CI= 0.0209, 0.6340) suggest that the indirect effect of attractive voice compared to unattractive voice on venture attraction through positive affect are unequal across the high and low positive expectancy violation conditions. So, the results of Panel C and Panel D combindly suggest that compared to unattractive voices, positive affect mediates the relationship between attractive voice and venture attraction and such indirect effects are moderated by expectation violations. Hence, our results support the hypothesized dual path moderated mediation model for venture attarction.

*2.4.7.2.2 Effect of Vocal Attractiveness on Information Retention*

H1b predicts that investors are more likely to retain information when the elevator pitch is presented in an attractive voice. To test for the H1b, we run ANCOVA with information retention as the dependent variable (see Table 2.2).

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Insert Table 2.2 about here

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We find that there is a significant effect of vocal attractiveness on information retention ($F = 3.77$, $p < 0.05$). Again, we conducted planned comparisons among the conditions to compare the differences between participants in unattractive, normal and attractive voice conditions (see Panel C, Table 2). We find that the mean information retention of participants in the attractive voice condition is significantly higher from the mean information retention of participants in unattractive condition ($F = 4.96$, $p < 0.05$). Hence, we can conclude that listening to the elevator pitch in an attractive voice significantly affected and increased information retention compared to listening to the elevator pitch in an unattractive voice.

Hypothesis 2b proposes that processing fluency partially mediates the effect of vocal attractiveness on information retention and H3a proposes that expectancy violations moderates the effect of vocal attractiveness on information processing. Using the bootstrapping approach (Hayes, 2017), we find a positive and significant relationship between vocal attractiveness and assessments of processing fluency and between processing fluency and information retention (see Panel A Table 2.5).

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Insert Table 2.5 about here

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From Panel A Table 2.5, we report that compared to unattractive voices, listening to normal ($\beta = 0.6568$, $p = 0.0003$) and attractive ($\beta = 2.0727$, $p = 0.0000$) voices significantly increases processing fluency and procesing fluency significantly increases information retention ($\beta = 0.0708$, $p = 0.0054$). These results suggest that processing fluency partially mediates the relationship between vocal attractiveness and information retention as the bootstrapped confidence intervals for the indirect effects did not contain zero (see Panel B Table 2.5; 10000 bootstrapped iterations). We also find that the indirect effect of vocal attractiveness on information retenstin via processing fluency is

moderated by expectation violations when the voice is normal and attractive as oppposed to unattractive. Panel C Table 2.5 provides the conditional indirect effects at values of the moderator, expectancy violations and panel D provides the index of moderated mediation. The results of Panel C and Panel D combindly suggest that compared to unattractive voices, processing fluency mediates the relationship between normal voice and information retention and such indirect effects are moderated by expectation violations ($z$ = 0.0732, 95% CI= 0.0092, 0.1974). Similarly, compared to unattractive voices, processing fluency mediates the relationship between attractive voice and information retention and such indirect effects are moderated by expectation violations ($z$ = 0.0738, 95% CI= 0.0098, 0.1935).

Hypothesis H2d proposes that positive affect partially mediates the effect of vocal attractiveness on information retention and H3b proposes that expectancy violations moderates the effect of vocal attractiveness on positive affect. To test for these hypotheses, we follow the same procedure as before. Results of these analyses are presented in Table 2.6.

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Insert Table 2.6 about here

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From Panel A of Table 2.6, we find that compared to unattractive voices, listening to normal (β =0.3389, $p$=0.0732) and attractive (β =0.5575, $p$=0.0024) voices significantly increases positive affect and positive affect significantly increases information retention (β =0.0585, $p$=0.0060). The inspection of bootstrap confidence intervals for the indirect effects, included in Panel B of Table 2.6, suggests that the hypothesized mediation occurred and positive affect mediates the effect of vocal attractiveness on information retention. Panel C and D of Table 2.6 provides the conditional effects and the index of moderated mediation, respectively. The analyses of the conditional effects and the index of moderated mediation suggest that the hypothesized moderated mediation does not occur for normal and attractive voice as some of the confidence intervals do include zero. The conditional effects and the index

of moderated mediation combindly suggest that while expectancy violations moderates the effects of vocal attractiveness on positive affect and positive affect mediates the effect of vocal attractiveness on information retention, such indirect effects are not significantly different across high and low expectancy violations conditions. As such the index of moderated mediation for normal voice ($z$ = 0.0270, 95% CI= -0.0281, 0.1087) and attractive voice ($z$ = 0.0447, 95% CI= -0.0052, 0.1366) both include zero, suggesting that at both high and low levels of positive and negative expectancy violations, the indirect effect of vocal attractiveness on information retention through positive affect are not significantly different.

### 2.4.8 Additional Analysis

In addition to the effect of vocal attractiveness on venture attraction and information retention, we also investgated the effect of vocal attractiveness on investment decisions. We asked the participants to indicate how likely are they to invest in the entrepreneurial idea based on their evaluation of the entrepreneur using a Likert-type scale ranging from 1 = *extremely unlikely* to 5 = *extremely likely*. We tested our hypothesized dual path moderated mediation model using investment choice as the dependent variable. In untabulated results[3], we find that investors are more likely to invest in the entrepreneurial venture when the elevator pitch is presented in an attractive voice. We also find that compared to listening to elevator pitch in unattractive voice, listening to elevator pitch in normal and attractive voices increases processing fluency which ultimately lead to increased likelihood of investing in the venture. In addition, the indirect effect of vocal attractiveness on investment via processing fluency is moderated by expectancy violations as the effect of expectancy violations on processing fluency is more negative when listeners' expectations are negativeley violated. Furthermore, we find that positive affect partially and significantly mediates the effects of vocal attractiveness on investment but the indirect effects of vocal attractiveness on investment through postive affect is not moderated by expectancy violations. These

[3] These results are available from the author upon request.

results reflect that vocal attractiveness can have significant implications for entrepreneurial outcomes and funding success.

### 2.4.9 Robustness Tests

While we randomly assigned participants to each condition, we linked the vocal attractiveness manipulation to the mediators—processing fluency and positive affect in predicting venture attraction and information retention. In this case, the mediators—processing fluency and positive affect can potentially be endogenous (Wennberg, Anderson, & McMullen, 2019). However, the chances of these mediators to be potentially endogenous arises from omitted variable bias and measurement error (Antonakis, Bendahan, Jacquart, & Lalive, 2010; Clougherty, Duso, & Muck, 2016; Wooldridge, 2010). The chances of having these problems are lower in our study because the common form of omitted-variable-based endogeneity is omitting selection, which occurs because of sample-selection bias. Also, we used validated and established scales with acceptable coefficient alphas to reduce the possibilities of measurement errors. But to rule out the possibility of simultaneous/reverse causality and endogeneity, we run several robustness tests. We run both two-stage least squares procedure and structural equation modelling to mitigate the concerns of endogeneity. The untabulated results from these robustness test suggest that processing fluency and positive affect are not endogeneous and our regression estimations are not biased[3].

In our experimental design, we kept the content of the elevator pitch constant across three conditions. To mitigate concerns that the content or description of the elevator pitch might interact with vocal attractiveness to influence venture attraction or information retention, we conduct another experiment in which 119 finacilaly literate participants were randomly assigned to the task of hearing either a successfully funded or unsuccessfully funded Kickstarter project pitch that included manipulations of one form of vocal attractiveness in a 3×2 factorial research design. Participants assumed the role of individual investors and listened to the funding pitches in identical testing conditions. In untabulated results**Error! Bookmark not defined.**, we find that vocal attractiveness has a significant effect on venture attraction and information retention even after

accounting for the content of the elevator pitch. The untabulated results suggest that participants in the attractive voice condition were more likely to remember information from the elevator pitches and indicate they would offer funding support across both the successfully funded and unsuccessfully funded project pitch conditions. Further, the effect of vocal attractiveness on venture attraction were more profound for unsuccessfully funded than successfully funded Kickstarter project.

### 2.4.10 Discussion of Study 1

Our results suggest that vocal attractiveness has a significant effect on venture attraction and information retention. Compared to unattractive voices, listening to attractive voices significantly increases attraction towards the venture and improves information retention. We also investigate *why* vocal attractiveness have this effect. Building on the heuristic information processing theory, we test if listening to unattractive voices hamper information processing and analyze if the cognitive and affective route to process heuristic cues can explain the impact of vocal attractiveness on venture attraction and information retention. As hypothesized, we found that voice serves as a heurstic cue and both cognitive (processing fluency) and affective (positive affect) route partially mediates the effect of vocal attractiveness on venture attraction and information retention. We further combine heuristic information processing theory with expectancy violation theory to suggest that investors' expectations play an important role in persuasive communications. Our results indicate that the processing of heuristic cues, i.e. vocal attractiveness through both cognitive (processing fluency) and affective (positive affect) route is indeed impacted by whether expectations are positively or negatively violated. Our results indicate that processing fluency and positive affect partially mediates the effect of vocal attractiveness on venture attraction and information retention and expectancy violations moderate the effect of vocal attractiveness on processing fluency and positive affect. So, study 1 results provide support for our moderated mediation model. To provide further support to our model, we conducted study 2.

## 2.5 Study 2

### 2.5.1 Overview of Study 2

Study 2 tests our hypothesized model using a factorial design. As human voice is sexually dimorphic and there is a documented gender bias favoring male entrepreneurs over females (Brooks, Huang, Kearney, & Murray, 2014), we test our model using both male and female voices. The purpose of study 2 is to provide further indication if male and female entrepreneurs' vocal attractiveness has significant effect on investors' information retention and attraction towards the venture. We also shed light on whether there is any differential effect of listening male entrepreneurs compared female entrepreneurs even though they are presenting the same business presentation.

### 2.5.2 Participants

We recruited 366 financially literate participants from a US university to take part in the study. Few filter questions were presented at the beginning of the survey to ensure that participants are aware of entrepreneurial funding process and entrepreneurial investment decision-making. We removed 7 participants who failed to answer or incorrectly answered the filter questions. We also removed 5 participants who failed one of the two attention checks, for a final sample of 353 financially literate participants as proxies for individual investors. Participants assume the role of individual investors who must understand and evaluate the entrepreneurial pitch to make subsequent investment decisions. Participants were an average of 21 years old and 63% of the participants were male.

### 2.5.3 Research Design

We employ a fully crossed, between-subjects 3×2 (*Vocal attractiveness*: attractive, normal/neutral, unattractive × *Speaker's sex:* male, female) factorial research design. Participants were randomly assigned to the task of hearing the same entrepreneurial pitch that included manipulations of one form of vocal attractiveness with either a female or male entrepreneur (i.e. one scenario out of six total scenarios).

After listening the elevator pitch, the participants responded to several survey items that assessed their information retention and attraction to the business advocated by the elevator pitch.

### 2.5.4 Materials and Procedures

The experiment is administered using the Qualtrics web-based survey service in a controlled-access computer lab and participants was recruited from the students' pool in a U.S. university. Participants had some business, finance, and entrepreneurial knowledge. To ensure participants meet this requirement, few filter questions were presented at the beginning of the web-based experiment. The participants who passed the screening criteria took part in the survey. Before starting the study, all participants were made aware that the data is being collected for only for research purposes and were assured that their responses will be kept confidential. In return for their participation, subjects were awarded extra credit. Upon arrival to the computer lab, each participant was seated at their assigned computer and provided with a pair of headphones. The participants were then briefed. After the briefing, participants provided their consent to the study and were randomly provided with photographs of either male or female entrepreneur. Only one version of the male and female photograph was provided across all identical conditions to control for the physical attractiveness of the entrepreneur. As attractiveness has been found to have cross-channel halo effects in which attractiveness in one dimension—physical or vocal—lead raters to infer attractiveness in the other dimension, vice versa (Zuckerman et al., 1991), we control for the physical attractiveness of the entrepreneurs. It is important to control for the physical attractiveness of the entrepreneurs because listeners have an overall tendency to associate attractive voices with attractive faces and vice-versa and such tendency impacts listener's perceptions regarding the speaker (Hughes & Miller, 2016). The photograph of the male and female entrepreneur was provided with the same description of the entrepreneur and explanation of the elevator pitch. This background information is provided to set participants' expectations regarding the following communication event and this approach is consistent with the approaches used in prior research

(Burgoon & Le Poire, 1993). The background information that accompanied the photographs is provided in the Appendix C. After viewing the photograph and reading the background information, participants were asked to put on their headphone. Participants then were instructed to listen to the elevator pitch by clicking a button on the Qualtrics webpage. Participants then listened to one randomly assigned treatment conditions and they were required to remain on the page that contained the audio of the funding pitch for the entire duration of the pitch, as the Qualtrics questionnaire did not become available until the completion of the pitch. After listening to the elevator pitches, participants completed the survey items. Participants were required to answer all questions in each section and were not allowed to return to a previous section after its completion. Participants were also instructed not to adjust the volume audio presented to them by altering the volume of the headphones or computer.

### 2.5.5 Manipulation of Vocal Attractiveness

Similar to Study 1, we use voice morphing software (Praat and Audacity) to manipulate several key stable and well-researched vocal cues that are found to influence perceptions of desired leadership characteristics—pitch, amplitude, pauses, and speech rate— to generate voices ranging from attractive to unattractive (DeGroot et al., 2011; DeGroot & Motowidlo, 1999). In study 2, we manipulate the above-mentioned acoustic cues for both male and female presenter to test our hypothesized model. The details of the manipulation of vocal attractiveness is presented in Appendix B.

### 2.5.6 Measures

#### *2.5.6.1 Dependent Variables*

##### *2.5.6.1.1 Information Retention*

To measure information processing, we used the same measure used in study 1. First as in sample 1, participants were asked five questions regarding the elevator pitch. The retention test scores were used to measure information retention. High scores on

the retention test indicates that the respondent remembered a greater proportion of information provided through the elevator pitch.

#### *2.5.6.1.2 Venture Attraction*

To measure venture attraction, participants were asked to rate if they loved the business idea presented in the elevator pitch, if they would like to hear more information about the business idea presented in the elevator pitch, if believe that the entrepreneur is a perfect fit for the venture, if the venture was worthy of financial support and indicated the likelihood of recommending the entrepreneur and the business to others, measured on a 7-item Likert scale. The scale is adopted from Baron et al. (2006). We use this multi-item scale instead of the one-item scale used in study 1 to better capture the potential investors' evaluation of the pitches. The principal component factor analysis indicated that all the items loaded significantly on a single component (all loadings >0.80), which had an eigenvalue of 4.10 and explained 90.31% of the variance. The Cronbach's alpha for the entire scale was 0.87 and composite reliability was 0.85. The participants were also asked to write the single most important factor that shaped their evaluation of the venture and entrepreneur.

### *2.5.6.2 Independent Variables*

The two independent variables are vocal attractiveness with three levels (ranging from attractive to unattractive) and gender (male vs female).

### *2.5.6.3 Mediating and Moderating variables*

#### *2.5.6.3.1 Processing Fluency*

In study 1, processing fluency was measured using a single-item scale. However, estimating processing fluency using a multi-item measure has been found to be more reliable and valid than single-item measure of processing fluency (Graf, Mayer, & Landwehr, 2018). So, in this study we measure processing fluency using a five-item scale from Graf et al., (2018). To measure processing fluency, participants were asked the question: "the process of understanding the content of the elevator pitch was"

anchored at *difficult* to *easy*, *unclear* to *clear*, *disfluent* to *fluent*, *effortful* to *effortless*, *incomprehensible* to *comprehensible*. Participants provided ratings on the five fluency items and the principal component factor analysis indicated that all the items loaded significantly on a single component (all loadings >0.91), which had an eigenvalue of 3.51 and explained 94.16% of the variance. The Cronbach's alpha for the entire scale was 0.90 and composite reliability was 0.87.

### *2.5.6.3.2 Positive Affect*

State positive affect (PA) was assessed using the 10-item version of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The 10 items used for positive affect were: "interested," "excited," "strong," "enthusiastic," "proud," "alert," "attentive," "determined," "inspired," and "active". Participants were asked to report their current feelings on each of the ten dimensions using a 5-point scale, ranging from 1= *not at all to* 5= *extremely*. We averaged the responses to form an overall measure of the funder's positive affect after listening to the funding pitch. The reliability coefficient alpha for the positive affect scale is 0.90 and composite reliability was 0.85.

### *2.5.6.3.3 Expectancy Violations*

To assess whether participants' expectations regarding the speakers' voice were violated while listening to the funding pitch, we adopted the 4-item scale developed by Burgoon & Walther (1990). Participants were asked to indicate whether the speaker's voice violated their expectations using a Likert-type scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The scale included the following items: "The speaker's voice during the elevator pitch was appropriate for business presentations," "The speaker's voice reflected normal conversational voice," "The speaker's voice was unusual (r)," and "The speaker's voice during the elevator pitch was like most people would sound during business presentations". The Cronbach's alpha estimate for the entire scale was 0.80 and composite reliability was 0.84.

*2.5.6.4 Controls*

Participants completed surveys indicating their age, gender, and existence of any hearing impediment. Participants were also asked if they were familiar with the presented business idea and provided ratings for the vocal and physical attractiveness of the speaker for manipulation checks. Participants also indicated the perceived passion and preparedness (Chen et al., 2009) the presenter.

### 2.5.7 Results

*2.5.7.1 Manipulation Checks*

Responses to the manipulation-check questions indicate that all manipulations were successful. Ninety-nine percent of the participants in the unattractive and attractive voice conditions correctly indicated that they find the voice of the presenter unattractive and attractive, respectively. None of the participant were familiar with the business idea presented in the pitch. To further determine the effectiveness of the manipulation of vocal attractiveness, a two-way analysis of variance (ANOVA) was performed on the ratings of the vocal attractiveness. Results suggest that the group who perceived the entrepreneur's voice as attractive reported higher venture attraction than the group who perceived the entrepreneur's voice as unattractive. So, results indicated a significant main effect of vocal attractiveness ratings on venture attraction ($F(2, 347) = 12.87$, $p = 0.0000$, $\eta_p^2 = 0.07$). Speakers' sex did not influence participants' venture attraction ($F(1, 347) = 0.58$, $p = 0.4460$, $\eta_p^2 = 0.002$) nor did it interfere with the manipulation of vocal attractiveness as the interaction term was insignificant ($F(2, 347) = 0.20$, $p = 0.8190$, $\eta_p^2 = 0.001$). In addition, the group who perceived the entrepreneur's voice as attractive retained more information than the group who perceived the entrepreneur's voice as unattractive. So, the results also indicated a significant main effect of vocal attractiveness ratings on information retention ($F(2, 347) = 17.35$, $p = 0.0000$, $\eta_p^2 = 0.09$). Speakers' sex did not influence participants' information retention ($F(1, 347) = 0.00$, $p = 0.9740$, $\eta_p^2 = 0.000$) nor did it interfere with the manipulation of vocal

attractiveness as the interaction term was insignificant (F (2, 347) = 0.12, $p$ = 0.8880, $\eta_p^2$ = 0.001). Therefore, our manipulation of vocal attractiveness was effective.

We found that 11 of the participants reported having a hearing impediment. However, excluding the participants who reported having a hearing impediment does not affect the results. Therefore, analyses include these participants and we control for hearing impediment in the analyses. To ensure that participants were actually expecting to hear normal voice and their expectations were violated, we compare the mean expectancy violations across three VA groups. We find that the mean expectancy violations across the three groups is significantly different (F = 6.57, $p$ = 0.0016) and the mean comparison suggests that the mean expectancy violations is lowest and significant when participants heard the normal voice than when they heard attractive or unattractive voice. Furthermore, to ensure that participants find both the male and female entrepreneur equally attractive in terms of physical attractiveness, we ask participants to judge and rate the physical attractiveness of the male and female entrepreneur. We find that the mean physical attractiveness ratings for male and female is not significantly different (F = 0.004, $p$ = 0.9966), suggesting that participants across male and female speaker conditions find the speaker equally attractive. Means, standard deviations, and intercorrelations between the study variables are presented in Table 2.7.

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Insert Table 2.7 about here

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To assess the degree of multicollinearity, we computed the variance inflation factor (VIF) of each independent variable and found that all the VIFs were less than 1.5, which is far below than the threshold VIF level of 4 (Hair et al., 1998), indicating that our model estimations do not suffer from a multicollinearity bias.

### *2.5.7.2 Hypothesis Tests*

#### *2.5.7.2.1 Effect of Vocal Attractiveness on Venture Attraction*

To test for the H1a, which predicts that investors are more likely to feel attracted towards the venture when the elevator pitch is presented in an attractive voice than when

elevator pitch is presented in an unattractive voice, we run ANCOVA with venture attraction as the dependent variable (see Table 2.8).

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Insert Table 2.8 about here

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In Panel A Table 2.8, we report that the average venture attraction ratings for male and female speakers and Panel B reports the ANCOVA results. The results suggest that there is a significant effect of vocal attractiveness on venture attraction (F = 29.75, $p$ =0.0000). To compare the differences between vocal attractiveness conditions, we conducted planned comparisons among the conditions (see Panel C, Table 2.8). The results suggest that the mean venture attraction of participants in the attractive voice condition is significantly higher from the mean venture attraction of participants in the unattractive voice condition (F = 58.26, $p$ =0.0000). Hence, we can conclude that listening to the elevator pitch in an attractive voice significantly increased venture attraction compared to listening to the elevator pitch in an unattractive voice. Although not hypothesized, we found a significant effect of speaker's sex on vocal attractiveness suggesting that investors feel more attracted towards the venture when the speaker was female compared to male (F = 17.76, $p$ =0.0000).

To test for moderated mediated effect of processing fluency proposed in H2a and H3a, we follow the bootstrapping approach and estimate the direct and indirect effects using 10000 bootstrapped iterations. Results of these analyses are presented in Table 2.10.

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Insert Table 2.10 about here

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As shown in Panel A of Table 2.10, we find that compared to unattractive voices, listening to normal (β =0.5686, $p$=0.0000) and attractive (β =0.6779, $p$=0.0000) voices significantly increases processing fluency and procesing fluency significantly increases venture attraction (β =0.1178, $p$=0.0001). The results also suggest that the expectancy

violations moderates the effect of vocal attractiveness on processing fluency only when the voice is attractive compared to unattractive ($\beta = 0.3754$, $p$=0.0390). The interaction effect of normal voices and expectancy violations on processing fluency is not statistically significant when compared to unattractive voices. The interactive effects are plotted in Figure 2.4 which shows the effects of unattractive, normal and attractive voice on processing fluency at low (−1 SD) or high (+1 SD) levels of positive and negative expectancy violations.

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Insert Figure 2.4 about here

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The figure suggests that processing fluency decline when expectations are violated but compared to unattractive and normal voices, the effect of expectancy violations on processing fluency is lower when participants listened to the attractive voice as the line becomes flatter when expectancy violations increases. So, the mean processing fluency in attractive voice conidtion does not decline as much as they do in unattractive voice conidtion when expectations are negatively violated. The mean processing fluency declines the most when participants heard the unattractive voice and the line becomes steeper as the negative expectancy violations increases. Further analyses of the interactions revealed that compared to unattractive voice, the effect of attractive voice on processing fluency is positive and significant at high (b=0.8672, $p$=0.0000) and only marginally significant at low (b=0.3653, $p$=0.0653) levels of expectancy violations. Hence, positively violating expectations through attractive voice lead to a more postive effect on processing fluency than negatively violating expectations through unattractive voice at high levels of expectancy violations.

The inspection of bootstrap confidence intervals for indirect effects, included in Panel B of Table 2.10, confirms the hypothesized mediation effects of processing fluency. Also, the indirect effect of vocal attractivenss on venture attraction via processing fluency is moderated by expectation violations when the voice is attractive as oppposed to unattractive. This can be concluded from the the conditional indirect

effects (see Panel C Table 2.10) and the index of moderated mediation (see Panel D Table 2.10). The results of Panel C and D combindly suggest that processing fluency mediates the relationship between vocal attractiveness and venture attraction and the indirect effects are moderated by expectation violations ($z$ = 0.0599, 95% CI= -0.0048, -0.1560). Hence, as hypothesized processing fluency mediates the effect of vocal attractiveness on venture attarction, and the indirect effects of vocal attractivenss on venture attraction via processing fluency are unequal across the high and low levels of positive versus negative expectancy violations conditions.

To test for moderated mediated effect of positive affect hypothesized in H2c and H3b, we again follow the same bootstrapping approach and the results are tabulated in Table 2.11.

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Insert Table 2.11 about here

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From Panel A of Table 2.11, we report compared to unattractive voices, listening to normal (β =1.2005, $p$=0.0000) and attractive (β =1.6344, $p$=0.0000) voices significantly increases positive affect and positive affect significantly increases venture attraction (β =0.2730, $p$=0.0012). The results also suggest that the effects of vocal attractiveness on positive affect is moderated by expectancy violations when the voice is normal compared to unattractive (β = 0.1150, $p$=0.0338) and when the voice is attractive compared to unattractive (β = 0.1709, $p$=0.0023). These interactive effects are plotted in Figure 2.5 which shows the effects of vocal attractiveness on positive affect at low (−1 SD) or high (+1 SD) levels of positive and negative expectancy violations.

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Insert Figure 2.5 about here

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The plot suggests that compared to participants who listen to unattractive voice, participants who listen to attractive and normal voice have high positive affect but positive affect declines when expectations are negatively violated. The effect of

expectancy violations on positive affect is lower when participants listened to the attractive voice compared to when participants listened to the unattractive voice. So, the mean postive affect in attractive voice condition does not decline as much as they do in unattractive voice condition when expectation violations are negative. Compared to unattractive voices, listening to attractive voices increases positive affect which ultimately lead to increased venture attraction. Further, the simple slope analyses suggest that compared to unattractive voice, the effect of attractive voice on positive affect is significant at both low (b= 1.5518, $p$=0.0000) and high (b=1.7176, $p$=0.0000) levels of expectancy violations. Also, compared to unattractive voice, the effect of normal voice on positive affect is significant at both low (b= 1.1428, $p$=0.0000) and high (b=1.2552, $p$=0.0000) levels of expectancy violations. These analyses suggest that compared to negatively violating expectations through unattractive voice, the effect of confirming expectations through normal voice or positively violating expectations through attractive voice on positive affect is more pronounced at both low and high levels of expectancy violations.

The bootstrap confidence intervals for the indirect effects of positive affect, included in Panel B of Table 2.11, confirms that positive affect partially mediates the relationship between vocal attractiveness and venture attraction. The conditional indirect effects and the index of moderated mediation provided in Panel C and Panel D of Table 2.11 combindly suggest that the indirect effect of vocal attractiveness on venture attraction via positive affect are significantly different across the high and low leevls of positive and negative expectancy violation conditions. So, we conclude that positive affect mediates the relationship between attractive voice and venture attraction and such indirect effects are moderated by expectation violations ($z$ = 0.0467, 95% CI= 0.0120, 0.0964). Hence, we find support for our dual path moderated mediation model outlined in Figure 2.1.

#### *2.5.7.2.2 Effect of Vocal Attractiveness on Information Retention*

To test for the H1b which predicts that investors are more likely to retain information when the elevator pitch is presented in an attractive voice, we run

ANCOVA with information retention as the dependent variable and present the results in Table 2.9.

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Insert Table 2.9 about here

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The results suggest that there is a significant effect of vocal attractiveness on information retention (F = 18.44, $p$ =0.0000). Again, we conducted planned comparisons among the three vocal attractiveness conditions to compare the differences between the conditions (see Panel C, Table 9). The results suggest that the mean information retention of participants in the attractive voice condition is significantly higher than the mean information retention of participants in unattractive voice condition (F = 36.87, $p$ =0.0000). So, participants in the attractive voice condition are more likely to retain information from the pitch than participants in the unattractive voice condition.

To test for moderated mediating effect of processing fluency as outlined in H2b and H3a, we estimate moderated mediation effects using the bootstrapping approach. The results of these analyses are presented in Table 2.12.

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Insert Table 2.12 about here

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As shown in Panel A of Table 2.12, we estimate that compared to unattractive voices, listening to normal (β =0.5686, $p$=0.0000) and attractive (β =0.6779, $p$=0.0000) voices significantly increases processing fluency and procesing fluency significantly increases information retention (β =0.0450, $p$=0.0001). As such, processing fluency partially mediates the relationship between vocal attractiveness on venture attration. Also, we find that the indirect effect of vocal attractiveness on information retention through procesing fluency is moderated by expectation violations. The inspection of bootstrap confidence intervals for the indirect effects, included in Panel B of Table 2.12, confirms the hypothesized mediation. Panel C and Panel D of Table 2.12 provides the

conditional effects and the index of moderated mediation, respectively. The results of Panel C and Panel D combindly suggest that processing fluency mediates the relationship between vocal attractiveness and information retention but such indirect effects are not significantly different for the participants who were in the normal voice condition than those who were in unattractive voice condition ($z$ = -0.0050, 95% CI= -0.0301, 0.0193) as the 95% confidence interval includes zero. However, the indirect effects of vocal attractiveness on information retention through processing fluency is moderated by expectation violations ($z$ = 0.0329, 95% CI= 0.0077, 0.0618) for the attractive voice condition compared to the unattractive voice condition. So, the indirect effects of processing fluency are moderated by expectation violations such that negatively violating expectaions lead to slower processing fluency whereas positively violating expectaions lead to higher processing fluency at both low and high levels of positive and negative expectancy violations.

To test for H2d and H3b which proposes that positive affect partially mediates the effect of vocal attractiveness on information retention and expectancy violations moderates the effect of vocal attractiveness on positive affect, we follow the same procedure as before. Results of these analyses are presented in Table 2.13.

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Insert Table 2.13 about here

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As shown in Panel A of Table 2.13, we find that compared to unattractive voices, listening to normal (β =1.2005, $p$=0.0000) and attractive (β =1.6344, $p$=0.0000) voices significantly increases positive affect and positive affect significantly increases information retention (β =0.1166, $p$=0.0003). Therfore, we find that positive affect partially mediates the effect of vocal attractivenss on information retentiona and expectancy violations moderates the mediating effect of positive affect. The inspection of bootstrap confidence intervals for the indirect effects (see Panel B of Table 2.13) suggests that the hypothesized mediation does occur for both normal and attractive voice as all the confidence intervals include zero. The conditional effects and the index of

moderated mediation presented in Panel C and D of Table 2.13 suggest that the hypothesized moderated mediation occured. The index of moderated mediation provides evidence that positive affect mediates the effect of vocal attractiveness on information retention and such indirect effects are moderated by expectancy violations as the index of moderated mediation for normal compared to unattractive voice ($z$ = 0.0134, 95% CI= 0.0014, 0.0295) and attractive compared to unattractive voice ($z$ = 0.0199, 95% CI= 0.0062, 0.0390) do not include zero. So, we find that vocal attractiveness have significant effect on information retention and positive affect partially mediates the effects of vocal attractiveness on information retention and the indirect effects are moderated by expectancy violations.

### 2.5.8 Additional Analysis

In addition to the effect of vocal attractiveness on venture attraction and information retention, we also investgated the effect of vocal attractiveness on investment decisions. We asked the participants to indicate their willingness to invest in the entrepreneurial idea using a Likert-type scale ranging from 1 = *extremely unlikely* to 5 = *extremely likely*. We then tested our hypothesized dual path moderated mediation model using investment choice as the dependent variable. In untabulated results[3], we find that investors are more likely to invest and invest a higher amount in the entrepreneurial venture when the elevator pitch is presented in an attractive voice. We also find that compared to listening to elevator pitch in unattractive voice, listening to elevator pitch in normal and attractive voices increases processing fluency which ultimately lead to increased likelihood of investing in the venture. In addition, the indirect effect of vocal attractiveness on investment via processing fluency is moderated by expectancy violations as the effect of expectancy violations on processing fluency is more negative when listeners' expectations are negativeley violated. Furthermore, we find that positive affect partially and significantly mediates the effects of vocal attractiveness on investment but the indirect effects of vocal attractiveness on investment through postive affect is not moderated by expectancy violations. These

results further confirms our theoretical predictions that vocal attractiveness can have significant implications for entrepreneurial outcomes and funding success.

### 2.5.9 Robustness tests

As in study1, we randomly assigned participants to each condition in study 2 but we linked the vocal attractiveness manipulation to the mediators—processing fluency and positive affect in predicting venture attraction and information retention. Hence, the mediators—processing fluency and positive affect can potentially be endogenous (Wennberg et al., 2019). However, the chances of these mediators to be potentially endogenous arises from omitted variable bias and measurement error (Antonakis et al., 2010; Clougherty et al., 2016; Wooldridge, 2010). The chances of having these problems are lower in our study because the common form of omitted-variable-based endogeneity is omitting selection, which occurs because of sample-selection bias. Also, we used validated and established scales with acceptable coefficient alphas to reduce the possibilities of measurement errors. But to rule out the possibility of simultaneous/reverse causality and endogeneity, we run several robustness tests. We run both two-stage least squares procedure and structural equation modelling to mitigate the concerns of endogeneity. The results sugessted that the mediating variables are not endogenous and our regression estimates are valid and reliable.[3]

### 2.5.10 Discussion of Study 2

Similar to study 1, our results from study 2 suggest that vocal attractiveness has a significant effect on venture attraction and information retention. Compared to unattractive voices, listening to attractive voices significantly increases attraction towards the venture and improves information retention. We also investigate if speaker's sex has any impact on information retention and venture attraction. We find that investors are more likely to be attracted towards the venture when the speaker is female than male even though they are presenting the same elevator pitch. However, no such effect of speaker's sex was found for information retention. In addition, we investigate *why* vocal attractiveness have positive effect on venture attraction and

information retention. By drawing from the heuristic information processing theory, we test if the cognitive and affective route to processing persuasion cues can explain the impact of vocal attractiveness on venture attraction and information retention. As hypothesized, we found that both processing fluency and state positive affect partially mediates the effect of vocal attractiveness on venture attraction and information retention. We further combined heuristic information processing theory with expectancy violation theory to report that investors' expectations play an important role in persuasive communications. Our results indicate that the effect of vocal attractiveness on both processing fluency and state positive affect is moderated by expectation violations. So, expectations about the entrepreneurs' way of speaking is a significant factor that has been overlooked in scholarly research and by incorporating investors' expectations in the heuristic information processing theory of persuasion we provide a complete picture of how investors process heuristic cues and how processing of and reaction to heuristic cues are impacted when expectations are violated. Results of study 2 further provide evidence that processing fluency and positive affect partially mediates the effect of vocal attractiveness on venture attraction and information retention and expectancy violations moderate the effect of vocal attractiveness on processing fluency and positive affect.

## 2.6 Discussion

In two experimental studies, we found that individual investors are more likely to retain information from the presented elevator pitch and feel attracted towards the venture when the elevator pitch is presented in an attractive voice compared to unattractive voice. We found support for a mediating mechanism of processing fluency and positive affect to explain why vocal attractiveness result in information retention and attraction to the venture advocated in the elevator pitch. Moreover, we found support for the moderating mechanism of expectation violations, such that those individuals whose expectations regarding the entrepreneurs' voice are violated had a lower processing fluency and positive affect than those whose expectations regarding the entrepreneurs' voice are not violated. Finally, we found support for the moderated

mediation effect of processing fluency, positive affect, and expectancy violations such that the indirect effect of processing fluency and positive affect on venture attraction and information retention are moderated by expectancy violations.

A plausible explanation for our results comes from the heuristic information processing theory (Chaiken, 1980; Chaiken & Ledgerwood, 2011). Speakers' voice, being a unique characteristic, is an important heuristic cue that can influence how investors perceive the entrepreneurs and impact investors' judgments. Indeed, results in study 1 and study 2 support the hypotheses that entrepreneurs' vocal attractiveness has a significant positive affect on venture attraction and information retention, suggesting that investors are more likely to feel attracted towards the venture and retain more information from the elevator pitch when the pitches are provided in attractive voice compared to unattractive voice even though the content of pitch is same. Drawing from the heuristic information processing theory, we further investigate the mechanisms through which vocal attractiveness has such effect on investors' judgements by assessing cognitive and affective routes of information processing. We argue that the impact of vocal attractiveness on investors' perceptions and judgements can be articulated through cognitive (processing fluency) and affective (positive affect) routes of information processing. The results from both study 1 and study 2 support our contention that processing fluency and positive affect mediates the effects of vocal attractiveness on venture attraction and information retention. In addition, we extend the heuristic information processing theory by incorporating investors' expectations and draw from EVT (Burgoon, 1993, 2015; Burgoon & Jones, 1976) to argue that unattractive creaky voices may negatively violate expectations regarding formal persuasive communication and business norms; hence, such unattractive creaky voices may therefore be distracting to the investors. Alternatively, attractive soothing voices may positively violate expectations regarding formal persuasive communication and business norms and may amplify the effect of vocal attractiveness on processing fluency and positive affect. As negatively violating expectations are distracting whereas positively violating expectations are beneficial in persuasive communications, we

propose that the effect of vocal attractiveness on processing fluency and positive affect depend on whether investors' expectations are positively or negatively violated. When investors' expectations are positively violated, the relationship between vocal attractiveness and processing fluency would be stronger than when investors' expectations are negatively violated; as such investors who listen to an elevator pitch in an attractive voice would have a higher level of processing fluency and state positive affect as their expectations are positively violated compared to investors who listen to the same elevator pitch in an unattractive voice as their expectations are negatively violated. Our results from both study 1 and 2 provide support for these relationships.

Results from study 1 and 2 suggest that processing fluency and positive affect mediates the effect of vocal attractiveness on venture attraction and information retention. Also, the results provide support towards the inclusion of investors' expectations in the heuristic information processing theory as the indirect effects of vocal attractiveness on venture attraction and information retention via processing fluency and positive affect are moderated by expectancy violations. These results were qualified in Study 2, which reported that when investors heard an elevator pitch in an attractive voice compared to unattractive voice, the prototypical nature of the voice made it easier to process the information and the attractive voice evoked positive affect, which in turn led to increased information retention and attraction towards the venture. In addition, when investors heard an elevator pitch in an attractive voice compared to unattractive voice their expectations regarding formal communications are positively violated, so their processing fluency and positive affect did not decline as much as they did in case of investors who heard the same elevator pitch in an unattractive voice. These findings help to extend the heuristic information processing theory of persuasion by demonstrating that negatively violating expectations regarding entrepreneurs' voice during formal business communication can affect successful persuasion as negatively violating expectations result in lower information processing and positive affect, even when the content of the persuasive message remains same.

Our study also provides some evidence reading the documented gender bias favoring male entrepreneurs over females in prior literature suggesting that investors prefer elevator pitches presented by male entrepreneurs than those presented by female entrepreneurs, even though the content of the elevator pitch was same (Brooks et al., 2014). We specifically investigate how sex of the entrepreneur influences the effects of vocal attractiveness on investors' information retention and venture attraction. Interestingly, while we find that entrepreneurs' sex has an impact on venture attraction, we did not find any evidence that entrepreneurs' sex has an impact on information retention. We also did not find any evidence that entrepreneurs' sex influences the effects of vocal attractiveness on investors' information retention and venture attraction. Our results suggest that while investors prefer ventures pitched by females, there were no joint effect of vocal attractiveness and entrepreneurs' sex on venture attraction. This finding is consistent with prior research suggesting that investors do not exhibit bias against female entrepreneurs and being a female entrepreneur does not reduce investors' interests in the venture (Balachandra et al., 2019).

### 2.6.1 Implications of the Research

While we know vocal attractiveness impacts how a speaker is perceived, we know little about how vocal attractiveness impacts information retention, choices, and decision-making. Our study has several theoretical and practical implications. *First,* we shed light on whether vocal attractiveness matters in an entrepreneurial context. The communication process between entrepreneurs and investors has noticeably high levels of uncertainty and high stakes and entrepreneurial pitching is one effective way through which entrepreneurs can convince investors to support their vision (Clarke et al., 2018). The research on entrepreneurial pitching is limited and fragmented (Chen et al., 2009) and researchers are still unsure about what factors influences the effectiveness of an entrepreneurial pitch. While investors scrutinize the nitty-gritty details of the textual communications made by entrepreneurs, they also closely evaluate verbal communications and are affected by the verbal and non-verbal cues, bodily movements and gestures (Clarke et al., 2018). We attempt to broaden this aspect of entrepreneurial

pitching and suggest that investors are also influenced by the vocal attractiveness of the entrepreneurs and entrepreneurs with more appealing voice make these entrepreneurs more successful in communication and persuasion. *Second*, we articulate the mechanisms through which vocal attractiveness impact investors' information retention and attraction to the venture during persuasive communication. We show that listening to attractive voices facilitates fluent information processing because salience of the communicators' attractiveness impacts how persuasive information is processed (Chaiken, 1979) and evoke positive feelings towards the entrepreneur (Baron et al., 2006; Niculescu, Van Dijk, Nijholt, & See, 2011), which ultimately impact investors reactions to the elevator pitch. Understanding this mediating mechanism shed lights on *how* vocal attractiveness impacts investors' judgements. *Third and finally*, we contribute to the heuristic information processing theory of persuasion by incorporating certain malleable factors which are omnipresent in everyday negotiations (such as voice and expectations) but which have heretofore been overlooked in scholarly research. By showing that voices are heuristic cues that influence decision-making and heuristic cues can lead to negative outcomes when such cues are not consistent with established expectations, we add to the heuristic information processing theory of persuasion by explaining how and whether the attractiveness of the very emblem of the entrepreneur during pitch presentation, i.e. his/her voice impacts individual investors reactions and emotions and what happens when expectations about entrepreneurs' voice are violated.

### 2.6.2 Limitations and Future Research

As is true for all research, our research also suffers from several limitations. First, the elevator pitch we used throughout all two studies were about a gender-neutral service. It is possible that the impact of expectancy violations on processing fluency and positive affect and the effect of vocal cues on male and female investors' judgements and perceptions will differ when the entrepreneur presents elevator pitches involving masculine and/or feminine products or services (Stafford, 1998). Future research can explore if the effect of vocal attractiveness will be different when the entrepreneur presents elevator pitches involving masculine and/or feminine products or services.

In the current set of studies that we undertook, we did not explore the ways to mitigate or possibly counter the effect of unattractive voices on venture attraction and information retention. We chose to explore the effect that unattractive voices have on venture attraction and information retention. However, future research on vocal attractiveness would be well served in examining interventions which could reduce the negative effects of unattractive voices on investors' perceptions and decision making. For example, both males and female can modulate their voices (Fraccaro et al., 2013) and altering voices to sound more dominant, competent, and trustworthy may attenuate the negative effects of unattractive voices on investors' perceptions about the entrepreneur. This notion is not unheard of as individuals were found to alter their vocal pitch according to the social contexts and depending on with whom they are communicating (Fraccaro et al., 2011). Individuals were found to alter their voice when their conversation partners are of higher social status during interviews (Gregory Jr & Webster, 1996), to speak with lower vocal pitch when leaving voicemails to physically attractive individuals (Hughes, Farley, & Rhodes, 2010). In addition, men were found to lower (raise) their voice pitch when speaking to competitors whom they deem less (more) dominant than themselves (Puts et al., 2006). Future research can investigate if deliberately altering voices can attenuate the negative impact of unattractive voice on investors' perceptions, judgments, and decisions.

Our results also open up other promising avenues for future scholarly research. Our two studies involve relatively formal forms of communication—recorded elevator pitches— which may be more strongly affected by investors' norms-driven expectations and thus expectation violations, leading to negative processing fluency and positive affect when expectations are negatively violated, which ultimately reduced venture attraction and information retention. Similarly, although we provided photographs of the "speakers" of the elevator pitch in Study 2, we provided the same photograph across all identical conditions. So, we did not test the joint effect of physical and vocal attractiveness on venture attraction and information retention by providing photographs with different levels of physical attractiveness. Also, our hypotheses are not tested in a

live interaction between speaker and listener. As such, future research can examine if and how our findings would manifest in situations that involve extended face-to-face interactions among the entrepreneurs, entrepreneurial teams, and investors. Also, research suggests that nonnative accented messages have negative impact on decision-making and choices (Livingston et al., 2017) but would this be true if the speaker who has nonnative accent speaks in an attractive voice or would the negative effect of unattractive voice become more negative when the speaker has a nonnative accent. In addition, future work may investigate alternative outcomes of vocal attractiveness (e.g., core self-evaluations, interpersonal helping or organizational citizenship behaviors), which may also suggest fascinating results and help extend the span of the effect of vocal attractiveness to other meaningful team and workplace outcomes (e.g., entrepreneurial team passion and performance, organizational justice perceptions, organizational commitment, job performance, managerial deception). These inquiries can open new, interesting, unexplored territory surrounding voice and vocal attractiveness for future scholars.

## 2.7 Conclusion

In this research, we drew on heuristic information processing theory and expectancy violations theory to develop a model of vocal attractiveness that underlie entrepreneurial venture success in terms of attracting potential investors. We then tested our hypotheses using a dual path moderated-mediation model. Based on two experiments, our results extend the scholarly understanding of entrepreneurs' vocal cues and potential advantages of vocal attractiveness in attracting investors and easy recall of information from the funding pitch. Our findings contribute to the entrepreneurship pitching literature because they demonstrate an alternative pathway for entrepreneurs that may allow them to overcome the challenges of gathering resources from potential investors. Because entrepreneurial pitching is a critical component for early-stage survival, our results have significant implications for entrepreneurs in persuasive contexts.

# CHAPTER TABLES AND FIGURES

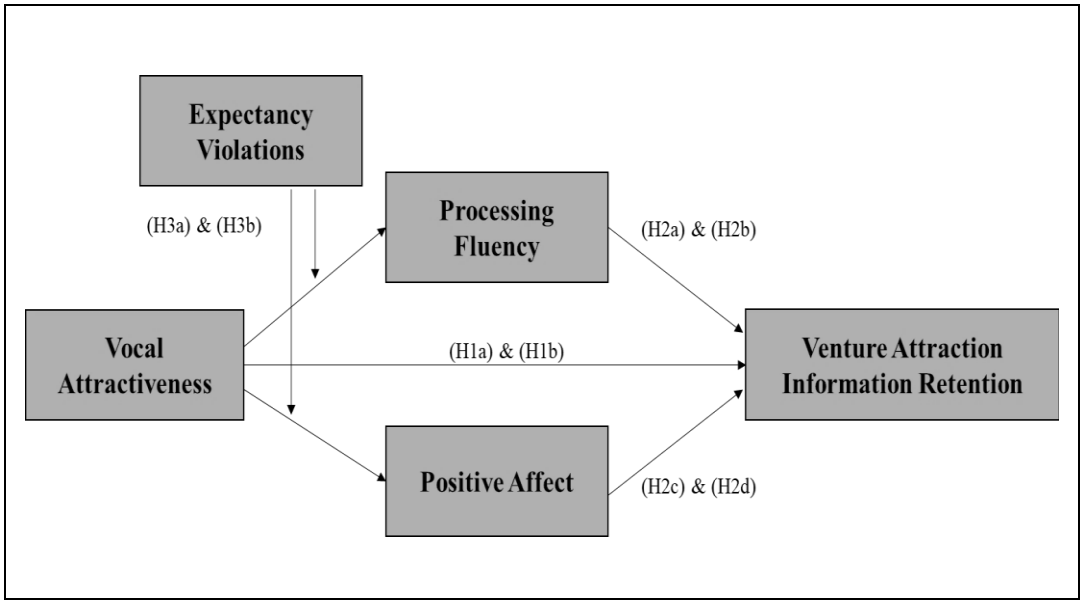


**Figure 2.1:** Conceptual Model of Vocal Attractiveness

**Table 2.1:** Descriptive Statistics and Correlations for Study 1 Sample

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Vocal Attractiveness | 1.96 | 0.82 | 1.00 | | | | | | | | | |
| 2. Venture Attraction | 3.68 | 0.81 | 0.45** | 1.00 | | | | | | | | |
| 3. Information Retention | 0.55 | 0.29 | 0.32** | 0.35** | 1.00 | | | | | | | |
| 4. Processing Fluency | 4.40 | 1.69 | 0.20 | 0.32** | 0.29** | 1.00 | | | | | | |
| 5. Positive Affect | 2.91 | 0.85 | 0.26** | 0.47** | 0.10 | 0.19 | 1.00 | | | | | |
| 6. Expectancy Violations | 2.68 | 0.53 | -0.12 | -0.19 | -0.20* | -0.12 | -0.11 | 1.00 | | | | |
| 7. Age | 20.09 | 1.71 | 0.17 | 0.09 | 0.13 | 0.11 | -0.00 | -0.04 | 1.00 | | | |
| 8. Gender | 0.53 | 0.50 | 0.08 | 0.10 | 0.11 | 0.09 | -0.07 | -0.05 | 0.07 | 1.00 | | |
| 9. Perceived Passion | 3.32 | 0.91 | 0.36** | 0.41** | 0.01 | 0.09 | 0.51** | 0.00 | 0.05 | -0.21 | 1.00 | |
| 10. Perceived Preparedness | 4.22 | 0.74 | 0.37** | 0.46** | 0.29** | 0.17 | 0.39** | -0.15 | 0.10 | -0.22 | 0.42** | 1.00 |

*Note: N* = 77.

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

***Correlation is significant at the 0.05 level (2-tailed).*

**Table 2.2:** Impact of Vocal Attractiveness on Venture Attraction and Information Retention for Study 1 Sample

**Test of H1a and H1b**

**Panel A: Cell Means**

| | | Venture Attraction | | | Information Retention | |
|---|---|---|---|---|---|---|
| **Vocal Attractiveness** | **n** | **Mean** | **S.D.** | **n** | **Mean** | **S.D.** |
| Unattractive | 26 | 3.167 | 1.1146 | 26 | 0.417 | 0.289 |
| Normal | 27 | 3.889 | 0.5774 | 27 | 0.481 | 0.250 |
| Attractive | 24 | 4.342 | 0.6272 | 24 | 0.642 | 0.287 |

**Panel B: Analysis of Covariance**

| | | Venture Attraction | | Information Retention | |
|---|---|---|---|---|---|
| **Source** | **D.F.** | **M.S.** | **F-value (p-value[a])** | **M.S.** | **F-value (p-value[a])** |
| Vocal Attractiveness (VA) | 2 | 6.2384 | 12.23 ($0.0000^{***}$) | 0.2877 | 3.77 ($0.0278^{**}$) |
| Age | 1 | 0.0025 | 0.00 (0.9442) | 0.0359 | 0.47 (0.4955) |
| Gender | 1 | 0.1449 | 0.28 (0.5958) | 0.0492 | 0.64 (0.4250) |
| Error | 72 | 0.5103 | | 0.0764 | |

**Panel C: Planned Comparisons**

**Test of Contrasts**

| | Venture Attraction | | Information Retention | |
|---|---|---|---|---|
| **Source** | **Estimate** | **F-value (p-value[a])** | **Estimate** | **F-value (p-value[a])** |
| Unattractive vs Normal | -0.7118 | 8.11 ($0.0057^{**}$) | -0.0513 | 0.28 (0.5976) |
| Attractive vs Normal | 0.4546 | 6.34 ($0.0140^{**}$) | 0.1564 | 5.01 ($0.0283^{**}$) |
| Attractive vs Unattractive | 1.1664 | 23.44 ($0.0000^{***}$) | 0.2076 | 4.96 ($0.0290^{**}$) |
| Unattractive vs (Normal + Attractive) | 1.8782 | 16.93 ($0.0001^{***}$) | 0.2589 | 2.15 (0.1471) |
| Normal vs (Unattractive +Attractive) | 0.2571 | 0.50 (0.4816) | 0.1051 | 0.56 (0.4574) |
| Attractive vs (Normal + Unattractive) | 1.6211 | 22.12 ($0.0000^{***}$) | 0.3640 | 7.45 ($0.0080^{**}$) |

[a] *$^{***}$p- value<0.001, $^{**}$p- value<0.05, $^{*}$p- value<0.10.*

**Table 2.3:** Moderated Mediation Effect of Processing Fluency on Venture Attraction for Study 1 Sample

| **Test of H2a and H3a** | | | | |
|---|---|---|---|---|
| **Panel A: Test of Direct Effects** | | | | |
| | **Processing Fluency** | | **Venture Attraction** | |
| **Variable** | **Coefficient** | **p-value**[a] | **Coefficient** | **p-value**[a] |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 0.6568 | 0.0003*** | 1.3312 | 0.0000*** |
| | (0.1712) | | (0.2024) | |
| Attractive | 2.0727 | 0.0000*** | 1.5989 | 0.0000*** |
| | (0.2378) | | (0.2271) | |
| **Expectancy Violations (EV)** | -2.1028 | 0.0000*** | | |
| | (0.3080) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | 0.8925 | 0.0190** | | |
| | (0.3712) | | | |
| VA- Attractive × EV | 0.9012 | 0.0248** | | |
| | (0.3926) | | | |
| **Processing Fluency** | | | 0.1490 | 0.0091*** |
| | | | (0.0555) | |
| **Age** | 0.0533 | 0.1935 | -0.1031 | 0.0001*** |
| | (0.0406) | | (0.0243) | |
| **Gender** | 0.1052 | 0.5743 | -0.1074 | 0.4357 |
| | (0.1865) | | (0.1370) | |
| **Perceived Passion** | 0.0452 | 0.5743 | 0.0982 | 0.2379 |
| | (0.0814) | | (0.0825) | |
| **Perceived Preparedness** | 0.1642 | 0.5810 | 0.1739 | 0.0983* |
| | (0.1171) | | (0.1038) | |
| **Constant** | 0.7120 | 0.4527 | 3.0958 | 0.0001*** |
| | (0.9427) | | (0.7326) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Venture Attraction**

**VA-Normal → Processing Fluency → Venture Attraction**

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 1.5134 | 0.1976 | 7.6601 | 1.1193 | 1.9074 |
| **Direct** | 1.3312 | 0.2024 | 6.5781 | 0.9275 | 1.7350 |

**Indirect Effects of VA on Venture Attraction through Processing Fluency**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.1821 | 0.0908 | 0.0309 | 0.3870 |

**VA-Attractive → Processing Fluency → Venture Attraction**

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 1.9703 | 0.2060 | 9.5640 | 1.5594 | 2.3811 |
| **Direct** | 1.5989 | 0.2271 | 7.0400 | 1.1458 | 2.0519 |

Continued

**Indirect Effects of VA on Venture Attraction through Processing Fluency**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.3714 | 0.1652 | 0.0690 | 0.7258 |

**Panel C: Conditional Indirect Effects of VA on Venture Attraction at values of EV**

**VA-Normal → Processing Fluency → Venture Attraction**

| **Expectancy Violations (EV)** | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0368 | 0.0138 | **0.0676** | **0.0118** |
| At Means | 0.0979 | 0.0545 | **0.0138** | **0.2252** |
| Mean + 1 S. D | 0.1690 | 0.0820 | **0.0348** | **0.3503** |

**VA-Attractive → Processing Fluency → Venture Attraction**

| **Expectancy Violations (EV)** | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Mean – 1 S. D | 0.5310 | 0.1982 | **0.1604** | **0.9395** |
| At Means | 0.4349 | 0.1540 | **0.1455** | **0.7455** |
| Mean + 1 S. D | 0.3387 | 0.1354 | **0.0950** | **0.6261** |

**Panel D: Index of Moderated Mediation**

**VA-Normal → Processing Fluency → Venture Attraction**

| **Moderator** | **Index** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Expectancy Violations | 0.1330 | 0.0881 | 0.0049 | 0.3475 |

**VA-Attractive → Processing Fluency → Venture Attraction**

| **Moderator** | **Index** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Expectancy Violations | 0.1343 | 0.0829 | 0.0143 | 0.3364 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.

[a] ***p- value <0.001,*

**p- value <0.05,*

*p- value <0.10.*

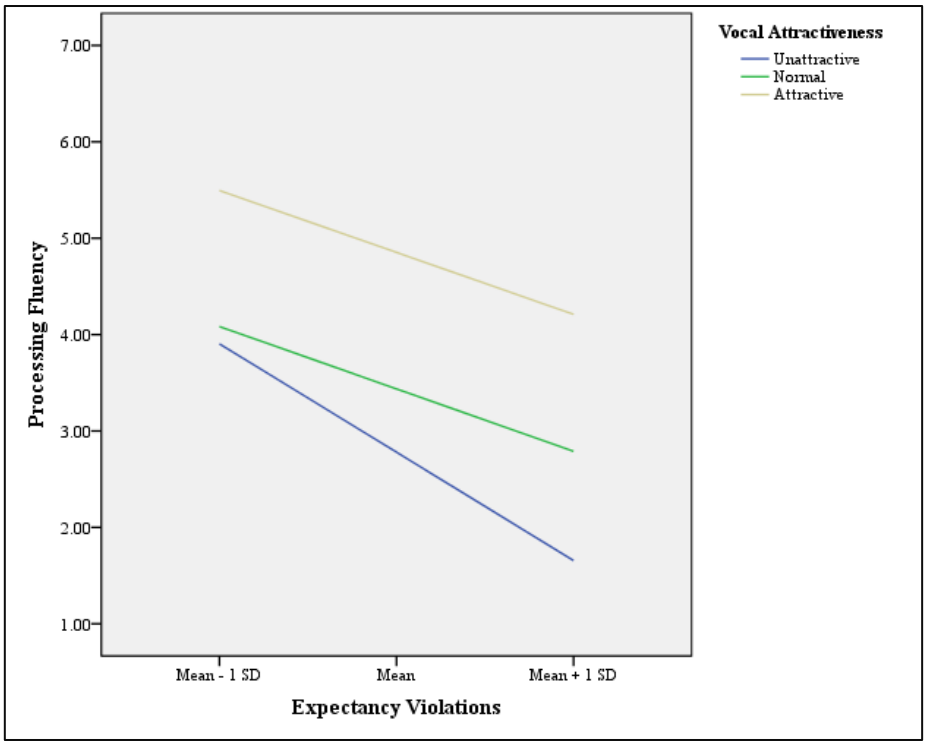


**Figure 2.2:** The Conditional Effects of Vocal Attractiveness on Processing Fluency at Low and High Levels of Positive and Negative Expectancy Violations for Study 1 Sample.

**Table 2.4:** Moderated Mediation Effect of Positive Affect on Venture Attraction for Study 1 Sample

| **Test of H2c and H3b** | | | | |
|---|---|---|---|---|
| **Panel A: Test of Direct Effects** | | | | |
| | **Positive Affect** | | **Venture Attraction** | |
| **Variable** | **Coefficient** | **p-value**[a] | **Coefficient** | **p-value**[a] |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 0.3389 | 0.0732* | 1.2871 | 0.0000*** |
| | (0.1862) | | (0.1777) | |
| Attractive | 0.5575 | 0.0024** | 1.6461 | 0.0000*** |
| | (0.1767) | | (0.1873) | |
| **Expectancy Violations (EV)** | -1.2523 | 0.0001*** | | |
| | (0.3066) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | 0.4626 | 0.2156 | | |
| | (0.3701) | | | |
| VA- Attractive × EV | 0.7647 | 0.0302** | | |
| | (0.3454) | | | |
| **Positive Affect** | | | 0.3146 | 0.0000*** |
| | | | (0.0695) | |
| **Age** | -0.0352 | 0.2133 | -0.0868 | 0.4812 |
| | (0.0280) | | (0.1226) | |
| **Gender** | -0.1036 | 0.4844 | -0.1335 | 0.2526 |
| | (0.1473) | | (0.1157) | |
| **Perceived Passion** | 0.0706 | 0.4390 | 0.0488 | 0.5014 |
| | (0.1105) | | (0.0722) | |
| **Perceived Preparedness** | 0.0925 | 0.3875 | 0.3037 | 0.0023** |
| | (0.1064) | | (0.0911) | |
| **Constant** | 2.9007 | 0.0001*** | 1.8363 | 0.0014** |
| | (0.7035) | | (0.7162) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Venture Attraction**

**VA-Normal → Positive Affect → Venture Attraction**

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 1.5009 | 0.1950 | 7.6957 | 1.1120 | 1.8899 |
| **Direct** | 1.2871 | 0.1777 | 7.2422 | 0.9325 | 1.6416 |

**Indirect Effects of VA on Venture Attraction through Positive Affect**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.2139 | 0.1065 | 0.0346 | 0.4489 |

**VA-Attractive → Positive Affect → Venture Attraction**

**Effects of VA on Venture Attraction**

Continued

| | Effect | SE | t-stat | LLCI | ULCI |
|---|---|---|---|---|---|
| **Total** | 1.9015 | 0.1943 | 9.7843 | 1.5139 | 2.2891 |
| **Direct** | 1.6461 | 0.1873 | 8.7899 | 1.2725 | 2.0197 |

**Indirect Effects of VA on Venture Attraction through Positive Affect**

| | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Indirect effect | 0.2554 | 0.1132 | 0.0721 | 0.5059 |

**Panel C: Conditional Indirect Effects of VA on Venture Attraction at values of EV**

**VA-Normal → Positive Affect → Venture Attraction**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0288 | 0.1284 | **-0.2415** | **0.2735** |
| At Means | 0.1066 | 0.0805 | **-0.0341** | **0.2797** |
| Mean + 1 S. D | 0.1844 | 0.1144 | **0.0048** | **0.4519** |

**VA-Attractive → Positive Affect → Venture Attraction**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.3467 | 0.1203 | **0.0918** | **0.2721** |
| At Means | 0.1754 | 0.0913 | **0.0217** | **0.3691** |
| Mean + 1 S. D | 0.3040 | 0.1365 | **0.0821** | **0.6015** |

**Panel D: Index of Moderated Mediation**

**VA-Normal → Positive Affect → Venture Attraction**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.1455 | 0.1704 | -0.1346 | 0.5373 |

**VA-Attractive → Positive Affect → Venture Attraction**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.2406 | 0.1695 | 0.0209 | 0.6340 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.
[a]*** *p- value <0.001,*
** *p- value <0.05,*
* *p- value <0.10.*

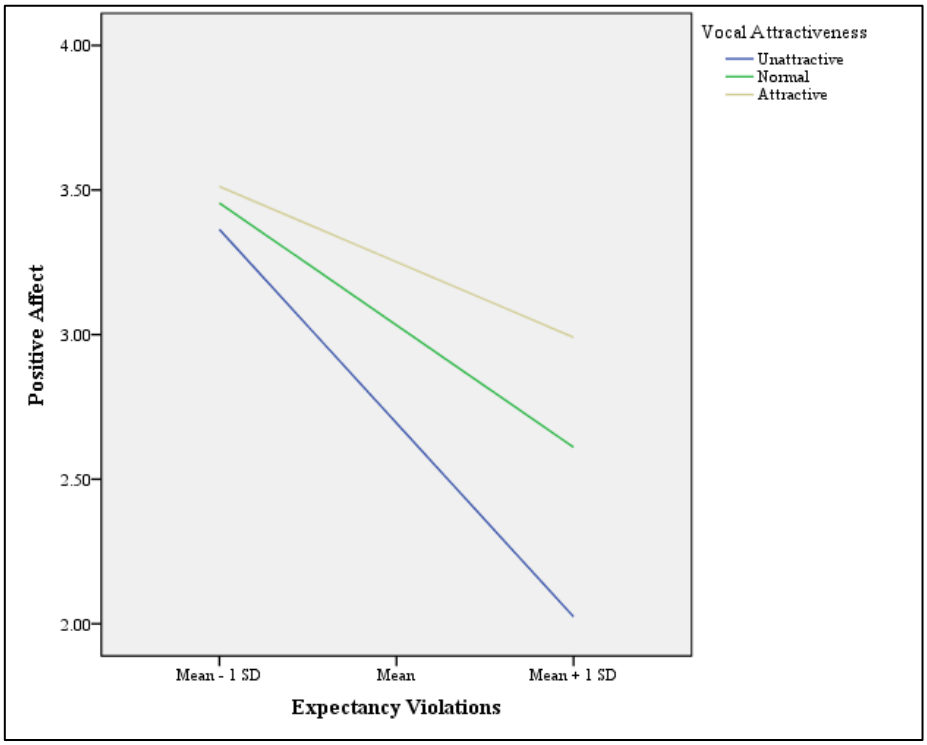


**Figure 2.3:** The Conditional Effects of Vocal Attractiveness on Positive Affect at Low and High Levels of Positive and Negative Expectancy Violations for Study 1 Sample.

**Table 2.5:** Moderated Mediation Effect of Processing Fluency on Information Retention for Study 1 Sample

| **Test of H2b and H3a** | | | | |
|---|---|---|---|---|
| **Panel A: Test of Direct Effects** | | | | |
| | **Processing Fluency** | | **Information Retention** | |
| **Variable** | **Coefficient** | **p-value**[a] | **Coefficient** | **p-value**[a] |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 0.6568 | 0.0003*** | 0.2019 | 0.0003** |
| | (0.1712) | | (0.0535) | |
| Attractive | 2.0727 | 0.0000*** | 0.3461 | 0.0008*** |
| | (0.2378) | | (0.0981) | |
| **Expectancy Violations (EV)** | -2.1028 | 0.0000*** | | |
| | (0.3080) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | 0.8925 | 0.0190** | | |
| | (0.3712) | | | |
| VA- Attractive × EV | 0.9012 | 0.0248** | | |
| | (0.3926) | | | |
| **Processing Fluency** | | | 0.0708 | 0.0054** |
| | | | (0.0246) | |
| **Age** | 0.0533 | 0.4782 | 0.0039 | 0.6110 |
| | (0.0406) | | (0.0076) | |
| **Gender** | 0.1052 | 0.9908 | -0.0150 | 0.7065 |
| | (0.1865) | | (0.0396) | |
| **Perceived Passion** | 0.0452 | 0.5743 | 0.0115 | 0.6205 |
| | (0.0814) | | (0.0232) | |
| **Perceived Preparedness** | 0.1642 | 0.5810 | 0.0396 | 0.2765 |
| | (0.1171) | | (0.0361) | |
| **Constant** | 0.7120 | 0.7841 | -0.2628 | 0.1981 |
| | (0.9427) | | (0.2022) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Information Retention**

**VA-Normal → Processing Fluency → Information Retention**

**Effects of VA on Information Retention**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.2885 | 0.0535 | 5.3925 | 0.1818 | 0.3951 |
| **Direct** | 0.2019 | 0.0535 | 3.7742 | 0.0952 | 0.3086 |

**Indirect Effects of VA on Information Retention through Processing Fluency**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.0866 | 0.0390 | 0.0244 | 0.1749 |

**VA-Normal → Processing Fluency → Information Retention**

**Effects of VA on Information Retention**

Continued

| | Effect | SE | t-stat | LLCI | ULCI |
|---|---|---|---|---|---|
| **Total** | 0.5226 | 0.0661 | 7.9115 | 0.3908 | 0.6543 |
| **Direct** | 0.3461 | 0.0981 | 3.5265 | 0.1503 | 0.5418 |

**Indirect Effects of VA on Information Retention through Processing Fluency**

| | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Indirect effect | 0.1765 | 0.0724 | 0.0554 | 0.3376 |

**Panel C: Conditional Indirect Effects of VA on Information Retention at values of EV**

**VA-Normal → Processing Fluency → Information Retention**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0327 | 0.0106 | **0.0110** | **0.0544** |
| At Means | 0.0465 | 0.0234 | **0.0106** | **0.1015** |
| Mean + 1 S. D | 0.0803 | 0.0391 | **0.0233** | **0.1770** |

**VA-Attractive → Processing Fluency → Information Retention**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.1127 | 0.0532 | **0.0271** | **0.2339** |
| At Means | 0.1468 | 0.0609 | **0.0470** | **0.2838** |
| Mean + 1 S. D | 0.1809 | 0.0769 | **0.0562** | **0.3608** |

**Panel D: Index of Moderated Mediation**

**VA-Normal → Processing Fluency → Information Retention**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.0732 | 0.0489 | 0.0092 | 0.1974 |

**VA-Attractive → Processing Fluency → Information Retention**

| Moderator | Index | Boot SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.0738 | 0.0481 | 0.0098 | 0.1935 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.

[a]****p- value <0.001,*

***p- value <0.05,*

**p- value <0.10.*

**Table 2.6:** Moderated Mediation Effect of Positive Affect on Information Retention for Study 1 Sample

| **Test of H2d and H3b** | | | | |
|---|---|---|---|---|
| **Panel A: Test of Direct Effects** | | | | |
| | **Positive Affect** | | **Information Retention** | |
| **Variable** | **Coefficient** | **p-value**[a] | **Coefficient** | **p-value**[a] |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 0.3389 | 0.0732* | 0.2472 | 0.0000*** |
| | (0.1862) | | (0.0523) | |
| Attractive | 0.5575 | 0.0024** | 0.4798 | 0.0000*** |
| | (0.1767) | | (0.0659) | |
| **Expectancy Violations (EV)** | -1.2523 | 0.0001*** | | |
| | (0.3066) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | 0.4626 | 0.2156 | | |
| | (0.3701) | | | |
| VA- Attractive × EV | 0.7647 | 0.0302** | | |
| | (0.3454) | | | |
| **Positive Affect** | | | 0.0585 | 0.0060** |
| | | | (0.0206) | |
| **Age** | -0.0352 | 0.2133 | 0.0098 | 0.2256 |
| | (0.0280) | | (0.0081) | |
| **Gender** | -0.1036 | 0.4844 | -0.0002 | 0.9967 |
| | (0.1473) | | (0.0426) | |
| **Perceived Passion** | 0.0706 | 0.4390 | 0.0142 | 0.5787 |
| | (0.1105) | | (0.0254) | |
| **Perceived Preparedness** | 0.0925 | 0.3875 | 0.0476 | 0.1932 |
| | (0.1064) | | (0.0362) | |
| **Constant** | 2.9007 | 0.0001*** | -0.4225 | 0.0343** |
| | (0.7035) | | (0.1956) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Information Retention**

**VA-Normal → Positive Affect → Information Retention**

**Effects of VA on Information Retention**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.2830 | 0.0537 | 5.3390 | 0.1798 | 0.3941 |
| **Direct** | 0.2472 | 0.0523 | 4.7277 | 0.1429 | 0.3515 |

**Indirect Effects of VA on Information Retention through Positive Affect**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.0397 | 0.0228 | 0.0019 | 0.0901 |

**VA-Normal → Positive Affect → Information Retention**

**Effects of VA on Information Retention**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.5273 | 0.0659 | 7.9984 | 0.3958 | 0.6587 |
| **Direct** | 0.4798 | 0.0659 | 7.2857 | 0.3484 | 0.6111 |

Continued

**Indirect Effects of VA on Information Retention through Positive Affect**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.0475 | 0.0259 | 0.0050 | 0.1051 |

**Panel C: Conditional Indirect Effects of VA on Information Retention at values of EV**

**VA-Normal → Positive Affect → Information Retention**

| **Expectancy Violations (EV)** | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0053 | 0.0265 | **-0.0450** | **0.0546** |
| At Means | 0.0198 | 0.0166 | **-0.0065** | **0.0562** |
| Mean + 1 S. D | 0.0343 | 0.0242 | **-0.0025** | **0.0922** |

**VA-Attractive → Positive Affect → Information Retention**

| **Expectancy Violations (EV)** | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0087 | 0.0253 | **-0.0399** | **0.0520** |
| At Means | 0.0326 | 0.0203 | **-0.0001** | **0.0766** |
| Mean + 1 S. D | 0.0565 | 0.0325 | **0.0052** | **0.1301** |

**Panel D: Index of Moderated Mediation**

**VA-Normal → Positive Affect → Information Retention**

| **Moderator** | **Index** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Expectancy Violations | 0.0270 | 0.0359 | -0.0281 | 0.1087 |

**VA-Attractive → Positive Affect → Information Retention**

| **Moderator** | **Index** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Expectancy Violations | 0.0447 | 0.0390 | -0.0052 | 0.1366 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.

[a]****p- value <0.001,*

***p- value <0.05,*

**p- value <0.10.*

**Table 2.7:** Descriptive Statistics and Correlations for Study 2 Sample

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Vocal Attractiveness | 2.01 | 0.82 | 1.00 | | | | | | | | | | | |
| 2. Venture Attraction | 3.12 | 0.78 | 0.36** | 1.00 | | | | | | | | | | |
| 3. Information Retention | 0.48 | 0.26 | 0.30** | 0.21** | 1.00 | | | | | | | | | |
| 4. Processing Fluency | 3.40 | 1.19 | 0.24** | 0.37** | 0.32** | 1.00 | | | | | | | | |
| 5. Positive Affect | 2.23 | 0.73 | 0.33** | 0.34** | 0.20** | 0.18** | 1.00 | | | | | | | |
| 6. Expectancy Violations | 2.80 | 0.48 | -0.03 | -0.05 | -0.19** | -0.26** | -0.16** | 1.00 | | | | | | |
| 7. Age | 21.25 | 2.74 | 0.01 | 0.02 | 0.04 | 0.10 | -0.10 | 0.11* | 1.00 | | | | | |
| 8. Gender | 0.63 | 0.48 | -0.03 | 0.00 | -0.18** | -0.04 | -0.01 | -0.04 | -0.03 | 1.00 | | | | |
| 9. Perceived Passion | 3.83 | 0.70 | 0.13* | 0.44** | 0.30** | 0.33** | 0.18** | -0.06 | -0.06 | 0.05 | 1.00 | | | |
| 10. Perceived Preparedness | 3.52 | 0.99 | 0.13* | 0.38** | 0.08 | 0.17** | 0.17** | -0.05 | -0.00 | 0.11* | 0.44** | 1.00 | | |
| 11. Speaker's Sex | 0.50 | 0.50 | 0.11* | 0.17** | 0.04 | -0.19 | -0.11 | 0.15 | 0.08 | -0.03 | -0.15 | -0.19 | 1.00 | |
| 12. Hearing Impediment | 0.04 | 0.20 | 0.03 | 0.05 | -0.12 | -0.08 | -0.00 | 0.05 | 0.32 | -0.00 | -0.11 | 0.01 | -0.06 | 1.00 |

*Note:* $N = 353$.

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

***Correlation is significant at the 0.05 level (2-tailed).*

**Table 2.8:** Impact of Vocal Attractiveness on Venture Attraction for Study 2 Sample

**Test of H1a**

**Panel A: Cell Means**

| | Speaker's Sex | | | | | |
|---|---|---|---|---|---|---|
| | Male | | | Female | | |
| **Vocal Attractiveness** | **n** | **Mean** | **S.D.** | **n** | **Mean** | **S.D.** |
| Unattractive | 48 | 2.68 | 0.718 | 67 | 3.05 | 0.764 |
| Normal | 62 | 2.82 | 0.736 | 57 | 3.31 | 0.682 |
| Attractive | 66 | 3.31 | 0.760 | 53 | 3.55 | 0.682 |

**Panel B: Analysis of Covariance**

| **Source** | **D.F.** | **M.S.** | **F-value** | **p-value**[a] |
|---|---|---|---|---|
| Vocal Attractiveness – H1a | 2 | 15.008 | 29.75 | 0.0000*** |
| Speakers' sex | 1 | 8.9587 | 17.76 | 0.0000*** |
| Vocal Attractiveness × Speakers' sex | 2 | 0.5832 | 1.16 | 0.3160 |
| Age | 1 | 0.0369 | 0.07 | 0.7871 |
| Gender | 1 | 0.0013 | 0.00 | 0.9593 |
| Hearing impediment | 1 | 0.1774 | 0.35 | 0.5536 |
| Error | 344 | 0.5045 | | |

**Panel C: Planned Comparisons**

**Test of Contrasts**

| **Source** | **Estimate** | **F-value** | **p-value**[a] |
|---|---|---|---|
| **Vocal Attractiveness** | | | |
| Unattractive vs Normal | -0.2710 | 8.89 | 0.0031** |
| Attractive vs Normal | 0.4370 | 22.23 | 0.0000*** |
| Attractive vs Unattractive | 0.7170 | 58.26 | 0.0000*** |
| Unattractive vs (Normal + Attractive) | 0.9970 | 37.18 | 0.0000*** |
| Normal vs (Unattractive +Attractive) | -0.1570 | 0.05 | 0.8250 |
| **Speaker's sex** | | | |
| Female vs Male | 0.3233 | 17.76 | 0.0000*** |

[a]****p- value<0.001,*** **p- value<0.05,* *p- value<0.10.*

**Table 2.9:** Impact of Vocal Attractiveness on Information Retention for Study 2 Sample

**Test of H1b**

**Panel A: Cell Means**

| | Speaker's Sex | | | | | |
|---|---|---|---|---|---|---|
| | Male | | | Female | | |
| **Vocal Attractiveness** | **n** | **Mean** | **S.D.** | **n** | **Mean** | **S.D.** |
| Unattractive | 48 | 0.383 | 0.247 | 67 | 0.373 | 0.220 |
| Normal | 62 | 0.487 | 0.275 | 57 | 0.477 | 0.261 |
| Attractive | 66 | 0.564 | 0.243 | 53 | 0.581 | 0.252 |

**Panel B: Analysis of Covariance**

| **Source** | **D.F.** | **M.S.** | **F-value** | **p-value**[a] |
|---|---|---|---|---|
| Vocal Attractiveness – H1b | 2 | 1.0930 | 18.44 | 0.0000*** |
| Speakers' sex | 1 | 0.0080 | 0.13 | 0.7136 |
| Vocal Attractiveness × Speakers' sex | 2 | 0.0071 | 0.12 | 0.8876 |
| Age | 1 | 0.1500 | 2.53 | 0.1125 |
| Gender | 1 | 0.6634 | 11.19 | 0.0009*** |
| Hearing impediment | 1 | 0.5231 | 8.83 | 0.0032** |
| Error | 344 | 0.0593 | | |

**Panel C: Planned Comparisons**

**Test of Contrasts**

| **Source** | **Estimate** | **F-value** | **p-value** |
|---|---|---|---|
| **VA** | | | |
| Unattractive vs Normal | -0.1039 | 10.41 | 0.0014*** |
| Attractive vs Normal | 0.0916 | 8.36 | 0.0041** |
| Attractive vs Unattractive | 0.1955 | 36.87 | 0.0000*** |
| Unattractive vs (Normal + Attractive) | 0.2994 | 28.53 | 0.0000*** |
| Normal vs (Unattractive +Attractive) | -0.1221 | 0.05 | 0.8250 |
| **Speaker's sex** | | | |
| Female vs Male | 0.0097 | 0.13 | 0.7136 |

[a] ****p- value<0.001, **p- value<0.05, *p- value<0.10.*

**Table 2.10:** Moderated Mediation Effect of Processing Fluency on Venture Attraction for Study 2 Sample

| **Test of H2a and H3a** | | | | |
|---|---|---|---|---|
| **Panel A: Test of Direct Effects** | | | | |
| | **Processing Fluency** | | **Venture Attraction** | |
| **Variable** | **Coefficient** | **p-value**[a] | **Coefficient** | **p-value**[a] |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 0.5686 | 0.0000*** | 0.1889 | 0.0261** |
| | (0.1257) | | (0.0846) | |
| Attractive | 0.6779 | 0.0000*** | 0.5037 | 0.0000*** |
| | (0.1370) | | (0.0865) | |
| **Expectancy Violations (EV)** | -0.7054 | 0.0000*** | | |
| | (0.1608) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | -0.1101 | 0.6565 | | |
| | (0.2473) | | | |
| VA- Attractive × EV | 0.3754 | 0.0390** | | |
| | (0.1812) | | | |
| **Processing Fluency** | | | 0.1178 | 0.0001*** |
| | | | (0.0307) | |
| **Age** | -0.0155 | 0.4782 | -0.0012 | 0.9197 |
| | (0.0219) | | (0.0118) | |
| **Gender** | -0.1397 | 0.2189 | -0.0272 | 0.6896 |
| | (0.1134) | | (0.0681) | |
| **Hearing Impediment** | 0.2341 | 0.3658 | -0.3035 | 0.0254** |
| | (0.2585) | | (0.1351) | |
| **Speaker's Sex** | 0.3433 | 0.0025** | 0.1344 | 0.0593* |
| | (0.1128) | | (0.0710) | |
| **Perceived Passion** | 0.4841 | 0.0000*** | 0.2881 | 0.0000*** |
| | (0.0869) | | (0.0561) | |
| **Perceived Preparedness** | -0.0151 | 0.8108 | 0.1418 | 0.0004*** |
| | (0.0631) | | (0.0393) | |
| **Constant** | 0.7230 | 0.3595 | 1.3385 | 0.0068** |
| | (0.7879) | | (0.4919) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Venture Attraction**

**VA-Normal → Processing Fluency → Venture Attraction**

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.2490 | 0.0835 | 2.9828 | 0.0848 | 0.4132 |
| **Direct** | 0.1889 | 0.0846 | 2.2341 | 0.0226 | 0.3552 |

**Indirect Effects of VA on Venture Attraction through Processing Fluency**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.0601 | 0.0239 | 0.0206 | 0.1130 |

**VA-Attractive → Processing Fluency → Venture Attraction**

Continued

**Effects of VA on Venture Attraction**

| | Effect | SE | t-stat | LLCI | ULCI |
|---|---|---|---|---|---|
| **Total** | 0.5820 | 0.0870 | 6.6878 | 0.4108 | 0.7531 |
| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
| **Direct** | 0.5037 | 0.0865 | 5.8225 | 0.3335 | 0.6738 |

**Indirect Effects of VA on Venture Attraction through Processing Fluency**

| | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Indirect effect | 0.0783 | 0.0279 | 0.0296 | 0.1393 |

**Panel C: Conditional Indirect Effects of VA on Venture Attraction at values of EV**

**VA-Normal → Processing Fluency → Venture Attraction**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0744 | 0.0303 | **0.0247** | **0.1414** |
| At Means | 0.0682 | 0.0246 | **0.0272** | **0.1249** |
| Mean + 1 S. D | 0.0620 | 0.0275 | **0.0189** | **0.1278** |

**VA-Attractive → Processing Fluency → Venture Attraction**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0512 | 0.0275 | **0.0041** | **0.1109** |
| At Means | 0.0799 | 0.0278 | **0.0319** | **0.1407** |
| Mean + 1 S. D | 0.1086 | 0.0395 | **0.0418** | **0.1962** |

**Panel D: Index of Moderated Mediation**

**VA-Normal → Processing Fluency → Venture Attraction**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | -0.0130 | 0.0318 | -0.0773 | 0.0522 |

**VA-Attractive → Processing Fluency → Venture Attraction**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.0599 | 0.0267 | 0.0144 | 0.1193 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.

[a]****p- value <0.001,*

***p- value <0.05,*

**p- value <0.10.*

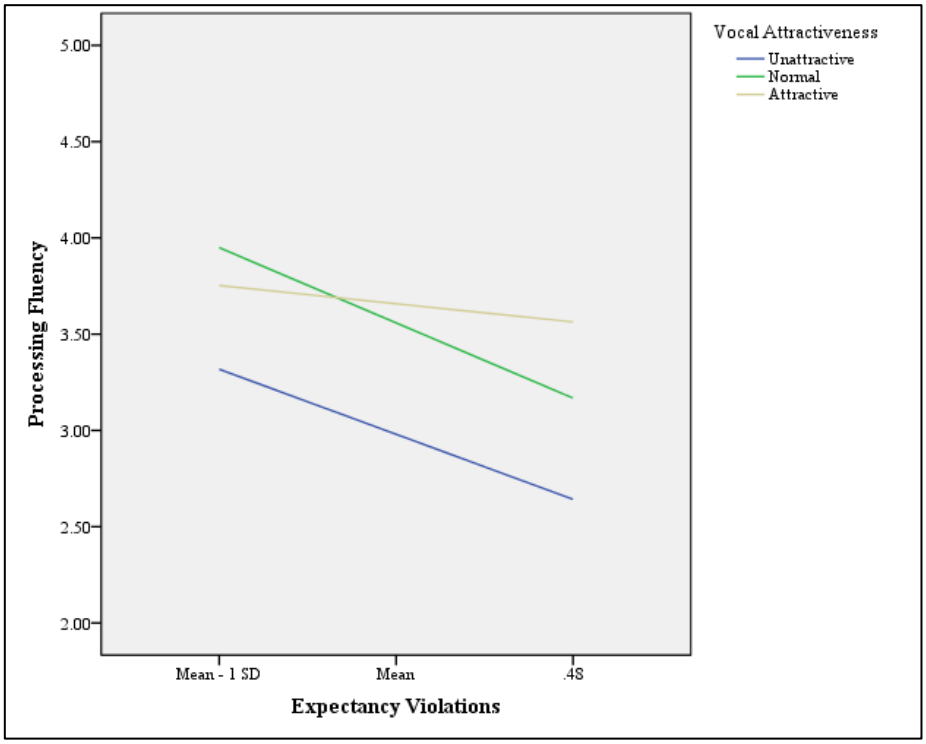


**Figure 2.4:** The Conditional Effects of Vocal Attractiveness on Processing Fluency at Low and High Levels of Positive and Negative Expectancy Violations for Study 2 Sample.

**Table 2.11:** Moderated Mediation Effect of Positive Affect on Venture Attraction for Study 2 Sample

**Test of H2c and H3b**

**Panel A: Test of Direct Effects**

| | Positive Affect | | Venture Attraction | |
|---|---|---|---|---|
| **Variable** | **Coefficient** | **p-value[a]** | **Coefficient** | **p-value[a]** |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 1.2005 | 0.0000*** | 0.2760 | 0.0128** |
| | (0.0216) | | (0.1078) | |
| Attractive | 1.6344 | 0.0000*** | 0.5029 | 0.0009*** |
| | (0.0254) | | (0.1495) | |
| **Expectancy Violations (EV)** | -0.7488 | 0.0000*** | | |
| | (0.0387) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | 0.1150 | 0.0338** | | |
| | (0.0540) | | | |
| VA- Attractive × EV | 0.1709 | 0.0023** | | |
| | (0.0557) | | | |
| **Positive Affect** | | | 0.2730 | 0.0012*** |
| | | | (0.0837) | |
| **Age** | 0.0048 | 0.0898* | 0.0083 | 0.4506 |
| | (0.0028) | | (0.0110) | |
| **Gender** | 0.0108 | 0.5760 | -0.1067 | 0.0937* |
| | (0.0194) | | (0.0635) | |
| **Hearing Impediment** | -0.0288 | 0.4548 | -0.1767 | 0.1684 |
| | (0.0383) | | (0.1280) | |
| **Speaker's Sex** | 0.0174 | 0.3842 | 0.1517 | 0.0264** |
| | (0.0200) | | (0.0680) | |
| **Perceived Passion** | 0.7752 | 0.0000*** | 0.1949 | 0.0000*** |
| | (0.5985) | | (0.0584) | |
| **Perceived Preparedness** | 0.0068 | 0.4968 | 0.0899 | 0.0195** |
| | (0.0100) | | (0.0383) | |
| **Constant** | 2.3996 | 0.0000*** | 1.1284 | 0.0135** |
| | (0.1269) | | (0.4542) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Venture Attraction**

**VA-Normal → Positive Affect → Venture Attraction**

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.4569 | 0.0767 | 5.9534 | 0.3059 | 0.6078 |
| **Direct** | 0.2760 | 0.1078 | 2.5603 | 0.0039 | 0.4281 |

**Indirect Effects of VA on Venture Attraction through Positive Affect**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.1808 | 0.0795 | 0.0228 | 0.3366 |

**VA-Attractive → Positive Affect → Venture Attraction**

Continued

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.9448 | 0.0818 | 11.5467 | 0.7838 | 1.1057 |
| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
| **Direct** | 0.5029 | 0.1495 | 3.3626 | 0.2087 | 0.7970 |

**Indirect Effects of VA on Venture Attraction through Positive Affect**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.4419 | 0.1401 | 0.1610 | 0.7127 |

**Panel C: Conditional Indirect Effects of VA on Venture Attraction at values of EV**

**VA-Normal → Positive Affect → Venture Attraction**

| **Expectancy Violations (EV)** | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Mean – 1 S. D | 0.3127 | 0.0977 | **0.1159** | **0.5020** |
| At Means | 0.3277 | 0.1032 | **0.1216** | **0.5302** |
| Mean + 1 S. D | 0.3428 | 0.1093 | **0.1265** | **0.5583** |

**VA-Attractive → Positive Affect → Venture Attraction**

| **Expectancy Violations (EV)** | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Mean – 1 S. D | 0.4239 | 0.1342 | **0.1558** | **0.6834** |
| At Means | 0.4462 | 0.1406 | **0.1656** | **0.7199** |
| Mean + 1 S. D | 0.4686 | 0.1476 | **0.1747** | **0.7528** |

**Panel C: Index of Moderated Mediation**

**VA-Normal → Processing Fluency → Venture Attraction**

| **Moderator** | **Index** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Expectancy Violations | 0.0314 | 0.0198 | 0.0018 | 0.0784 |

**VA-Attractive → Processing Fluency → Venture Attraction**

| **Moderator** | **Index** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Expectancy Violations | 0.0467 | 0.0217 | 0.0120 | 0.0964 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.

[a]*** *p- value <0.001,*

** *p- value <0.05,*

* *p- value<0.10.*

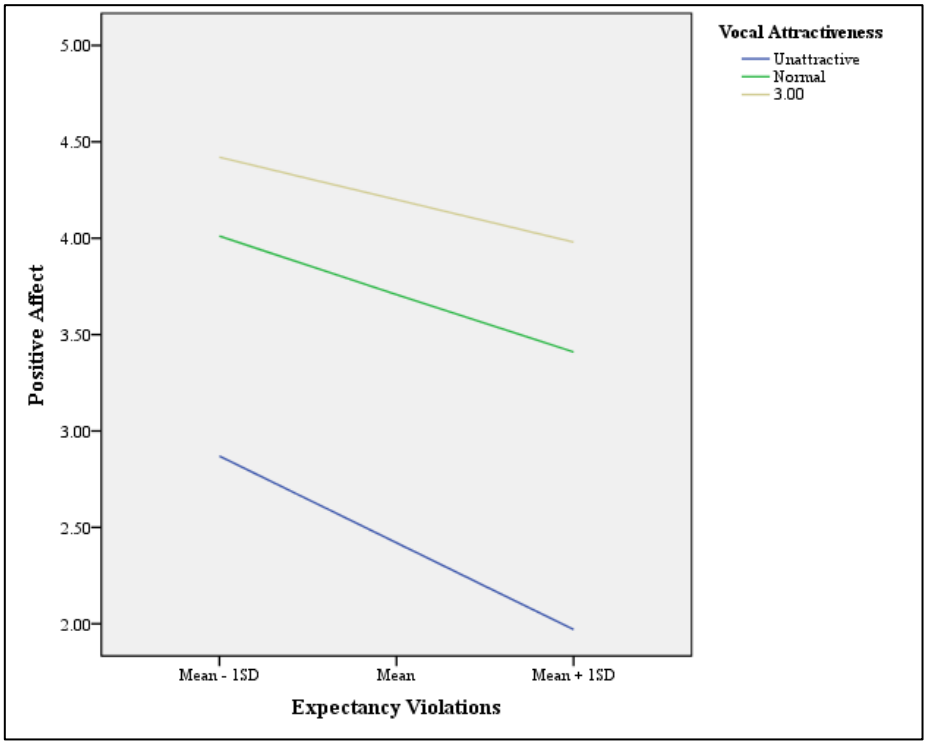


**Figure 2.5:** The Conditional Effects of Vocal Attractiveness on Positive Affect at Low and High Levels Positive and Negative Expectancy Violations for Study 2 Sample.

**Table 2.12:** Moderated Mediation Effect of Processing Fluency on Information Retention for Study 2 Sample

| **Test of H2b and H3a** | | | | |
|---|---|---|---|---|
| **Panel A: Test of Direct Effects** | | | | |
| | **Processing Fluency** | | **Information Retention** | |
| **Variable** | **Coefficient** | **p-value**[a] | **Coefficient** | **p-value**[a] |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 0.5786 | 0.0000*** | 0.0807 | 0.0071** |
| | (0.1257) | | (0.0298) | |
| Attractive | 0.6779 | 0.0000*** | 0.1427 | 0.0000*** |
| | (0.1370) | | (0.0317) | |
| **Expectancy Violations (EV)** | -0.7054 | 0.0000*** | | |
| | (0.1608) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | -0.1101 | 0.6565 | | |
| | (0.2473) | | | |
| VA- Attractive × EV | 0.3754 | 0.0390** | | |
| | (0.1812) | | | |
| **Processing Fluency** | | | 0.0450 | 0.0000*** |
| | | | (0.0109) | |
| **Age** | -0.0155 | 0.4782 | 0.0093 | 0.0298 |
| | (0.0219) | | (0.0043) | |
| **Gender** | -0.1397 | 0.2189 | -0.0888 | 0.0006*** |
| | (0.1134) | | (0.0256) | |
| **Hearing Impediment** | 0.2341 | 0.3658 | 0.1450 | 0.0086** |
| | (0.2585) | | (0.0549) | |
| **Speaker's Sex** | 0.3433 | 0.0025** | -0.0288 | 0.2578 |
| | (0.1128) | | (0.0254) | |
| **Perceived Passion** | 0.4841 | 0.0000*** | 0.0887 | 0.0000*** |
| | (0.0869) | | (0.0190) | |
| **Perceived Preparedness** | -0.0151 | 0.8108 | -0.0159 | 0.2821 |
| | (0.0631) | | (0.0148) | |
| **Constant** | 0.7230 | 0.3595 | -0.3514 | 0.0382** |
| | (0.7879) | | (0.1689) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Information Retention**

**VA-Normal → Processing Fluency → Information Retention**

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.1036 | 0.0302 | 3.4363 | 0.0443 | 0.1630 |
| **Direct** | 0.0807 | 0.0298 | 2.7070 | 0.0221 | 0.1393 |

**Indirect Effects of VA on Information Retention through Processing Fluency**

| | **Effect** | **SE** | **LLCI** | **ULCI** |
|---|---|---|---|---|
| Indirect effect | 0.0230 | 0.0088 | 0.0078 | 0.0424 |

**VA-Attractive → Processing Fluency → Information Retention**

Continued

**Effects of VA on Information Retention**

| | Effect | SE | t-stat | LLCI | ULCI |
|---|---|---|---|---|---|
| **Total** | 0.1726 | 0.0309 | 5.5930 | 0.1119 | 0.2333 |
| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
| **Direct** | 0.1427 | 0.0317 | 4.5051 | 0.0804 | 0.2050 |

**Indirect Effects of VA on Information Retention through Processing Fluency**

| | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Indirect effect | 0.0299 | 0.0098 | 0.0123 | 0.0503 |

**Panel C: Conditional Indirect Effects of VA on Information Retention at values of EV**

**VA-Normal → Processing Fluency → Information Retention**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0284 | 0.0114 | **0.0097** | **0.0537** |
| At Means | 0.0260 | 0.0091 | **0.0109** | **0.0463** |
| Mean + 1 S. D | 0.0237 | 0.0102 | **0.0068** | **0.0466** |

**VA-Attractive → Processing Fluency → Information Retention**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.0196 | 0.0112 | **0.0011** | **0.0443** |
| At Means | 0.0305 | 0.0099 | **0.0136** | **0.0519** |
| Mean + 1 S. D | 0.0415 | 0.0125 | **0.0196** | **0.0677** |

**Panel D: Index of Moderated Mediation**

**VA-Normal → Processing Fluency → Information Retention**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | -0.0050 | 0.0121 | -0.0301 | 0.0193 |

**VA-Attractive → Processing Fluency → Information Retention**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.0329 | 0.0136 | 0.0077 | 0.0618 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.
[a]*** *p- value <0.001,*
** *p- value <0.05,*
* *p- value <0.10.*

**Table 2.13:** Moderated Mediation Effect of Positive Affect on Information Retention for Study 2 Sample

| **Test of H2d and H3b** | | | | |
|---|---|---|---|---|
| **Panel A: Test of Direct Effects** | | | | |
| | **Positive Affect** | | **Information Retention** | |
| **Variable** | **Coefficient** | **p-value**[a] | **Coefficient** | **p-value**[a] |
| **Vocal Attractiveness (VA)** | | | | |
| Normal | 1.2005 | 0.0000*** | 0.1382 | 0.0128** |
| | (0.0216) | | (0.0446) | |
| Attractive | 1.6344 | 0.0000*** | 0.1885 | 0.0013*** |
| | (0.0254) | | (0.0590) | |
| **Expectancy Violations (EV)** | -0.7488 | 0.0000*** | | |
| | (0.0387) | | | |
| **VA × EV** | | | | |
| VA- Normal × EV | 0.1150 | 0.0338** | | |
| | (0.0540) | | | |
| VA- Attractive × EV | 0.1709 | 0.0023** | | |
| | (0.0557) | | | |
| **Positive Affect** | | | 0.1166 | 0.0003*** |
| | | | (0.0316) | |
| **Age** | 0.0048 | 0.0898* | 0.0089 | 0.0566* |
| | (0.0028) | | (0.0047) | |
| **Gender** | 0.0108 | 0.5760 | -0.0973 | 0.0002*** |
| | (0.0194) | | (0.0257) | |
| **Hearing Impediment** | -0.0288 | 0.4548 | -0.1767 | 0.1684 |
| | (0.0383) | | (0.1280) | |
| **Speaker's Sex** | 0.0174 | 0.3842 | -0.0213 | 0.3893 |
| | (0.0200) | | (0.0247) | |
| **Perceived Passion** | 0.7752 | 0.0000*** | 0.1096 | 0.0000*** |
| | (0.5985) | | (0.0187) | |
| **Perceived Preparedness** | 0.0068 | 0.4968 | 0.0899 | 0.0195** |
| | (0.0100) | | (0.0383) | |
| **Constant** | 2.3996 | 0.0000*** | -0.6027 | 0.0009*** |
| | (0.1269) | | (0.1800) | |

**Panel B: Mediator Model suggesting the Indirect Effects of VA on Information Retention**

**VA-Normal → Positive Affect → Information Retention**

**Effects of VA on Venture Attraction**

| | **Effect** | **SE** | **t-stat** | **LLCI** | **ULCI** |
|---|---|---|---|---|---|
| **Total** | 0.2710 | 0.0302 | 8.9735 | 0.2117 | 0.3304 |
| **Direct** | 0.1382 | 0.0446 | 3.0987 | 0.0505 | 0.2259 |

**Indirect Effects of VA on Information Retention through Positive Affect**

Continued

| | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Indirect effect | 0.1328 | 0.0368 | 0.0604 | 0.2062 |

**VA-Attractive → Positive Affect → Information Retention**

**Effects of VA on Venture Attraction**

| | Effect | SE | t-stat | LLCI | ULCI |
|---|---|---|---|---|---|
| **Total** | 0.3713 | 0.0309 | 12.0162 | 0.3106 | 0.4320 |
| **Direct** | 0.1825 | 0.0590 | 3.0932 | 0.0664 | 0.2987 |

**Indirect Effects of VA on Information Retention through Positive Affect**

| | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Indirect effect | 0.1888 | 0.0524 | 0.0856 | 0.2939 |

**Panel C: Conditional Indirect Effects of VA on Information Retention at values of EV**

**VA-Normal → Positive Affect → Information Retention**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.1336 | 0.0376 | **0.0596** | **0.2076** |
| At Means | 0.1400 | 0.0387 | **0.0630** | **0.2149** |
| Mean + 1 S. D | 0.1465 | 0.0400 | **0.0655** | **0.2249** |

**VA-Attractive → Positive Affect → Information Retention**

| Expectancy Violations (EV) | Effect | SE | LLCI | ULCI |
|---|---|---|---|---|
| Mean – 1 S. D | 0.1811 | 00503 | **0.0812** | **0.2782** |
| At Means | 0.1906 | 0.0525 | **0.0857** | **0.2918** |
| Mean + 1 S. D | 0.2002 | 0.0550 | **0.0899** | **0.3063** |

**Panel D: Index of Moderated Mediation**

**VA-Normal → Processing Fluency → Information Retention**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.0134 | 0.0071 | 0.0014 | 0.0295 |

**VA-Attractive → Processing Fluency → Information Retention**

| Moderator | Index | SE | LLCI | ULCI |
|---|---|---|---|---|
| Expectancy Violations | 0.0199 | 0.0084 | 0.0062 | 0.0390 |

*Note:* Heteroskedasticity-consistent standard errors are in parentheses.

[a]*** *p- value <0.001,*

** *p- value <0.05,*

* *p- value <0.10.*

# CHAPTER 3: PITCH LIKE A MAN TO FIT IN? HOW GENDER AND PRODUCT GENDER CONGRUENCE AFFECT INVESTORS' DECISIONS

## 3.1 Introduction

> "It's hard to say which physical attributes of Theranos founder Elizabeth Holmes stand out most: her turtlenecks; her ginormous, unblinking eyes; her perma-red lips. There's a lot to work with. But one thing is for certain: when she starts talking, everyone notices her voice. It's deep, almost impossibly so!"
>
> −Yohana Desta (2019)

> "Silicon Valley was overwhelmingly a man's world. The VCs were all male and Greg couldn't think of any prominent female startup founder. At some point Holmes must have decided the deep voice was necessary to get people's attention and be taken seriously."
>
> − John Carreyrou, (2018: 162)

> "Elizabeth Holmes' voice is a trademark"
>
> −Paige Leskin, (2019)

The disgraced CEO of Theranos, Elizabeth Holmes, who was once believed to be revolutionizing the US healthcare industry and touted as "The Next Steve Jobs," is now indicted on criminal charges of wire fraud. The blood testing technology that Theranos developed was supposed to revolutionize the industry by needing only a few drops of blood from a pin prick for tests rather than several tubes of blood drawn from veins in the arm. However, this technology was never efficacious even though it was presented as such. Holmes reportedly raised $400 million in funding and even worked with Walgreen's to open wellness centers inside the company's drugstores (Weisul, 2015). As the scandal has unfolded, what has fascinated the masses more than the story of the downfall of Theranos is Holmes' unusually deep baritone voice—the voice she is accused of faking to fit into the male-dominated Silicon Valley scene. Before her downfall, Holmes was frequently compared to Steve Jobs and she abetted this comparison by copying Job's style – both in clothing and in a low baritone voice. She reportedly faked her voice to sound more dominant and leader-like in the realm of male

VCs and angel investors. However, many investors and employees said that they were taken aback during the first meeting with Holmes due to her distinctively deep voice (Hartmans & Leskin, 2020). Whether Holmes' voice was a façade to convince investors or not, this real-life story of master manipulation and deception unravels a fact that female entrepreneurs often feel the need to adopt gendered persona, verbal, and non-verbal behaviors to persuade investors.

Entrepreneurship has often been viewed as an occupation with a masculine identity as it requires competence, leadership abilities, dominance, and assertiveness. These notions of entrepreneurship are often attributed to masculinity and males are deemed more capable as entrepreneurs than females because of having these masculine qualities (Bruni, Gherardi, Poggio, 2004a). As voice is a unique characteristic that carries socially relevant information about traits and personality (Latinus & Belin, 2011), it has important consequences in the context of entrepreneurial pitching. During the early-stages of entrepreneurial ventures, entrepreneurs often seek external funding and they need to communicate with potential investors, such as venture capitalists and business angels, through venture pitches and presentations to convince the potential investors that the venture has potential and that they are a perfect fit for the venture (Bird & Schjoedt, 2009; Clarke et al., 2018). During these presentations, entrepreneurs use both verbal and nonverbal expressive behaviors to persuade these experienced and savvy investors (Clarke et al., 2018; Huang & Pearce, 2015; Jachimowicz, To, Agasi, Côté, & Galinsky, 2019). Entrepreneurs will try to provide "glimpses" of who they are to investors through expressive cues (Clarke et al., 2018: 338). They do this by displaying appropriate gendered behaviors as investors typically have gendered expectations regarding how entrepreneurs should act, behave, speak, and respond during a venture pitch (Balachandra et al., 2013, 2019; Kanze et al., 2018). As voice provides cues for the speaker's confidence levels, competence, dominance, trustworthiness, affective states, intelligence, credibility, and attitudes (Gelinas-Chebat & Chebat, 1992; Hodges-Simeon, Gaulin, & Puts, 2010; Mayew & Venkatachalam, 2012; Scherer, London, & Wolf, 1973; Schirmer, Feng, Sen, & Penney, 2019) and because voice also

impacts personality judgements and interpersonal attraction (Oguchi & Kikuchi, 1997), entrepreneurs' gendered voice is an important aspect of entrepreneurial pitching. By gendered voice we refer to the voice cues or vocal qualities that provide information about the speakers, their positions, choices, and gendered identities (Abdelhay, 2014). Speakers are known to modulate their voices according to the context to depict certain qualities (Fraccaro et al., 2011, 2013). For example, depending on the context, women can use a deep or thick voice that is traditionally characterized as masculine, whereas men can use a breathy or soft voice that is deemed feminine. Hence, men and women often construct and demonstrate their masculinity and femininity through voice (Abdelhay, 2014). We argue that the use of gendered voice during venture pitches can influence investors' perceptions, attitudes, and choices. Despite being an important aspect in evaluating the entrepreneurs' capabilities and credibility, gendered voice has received little scholarly attention in the entrepreneurial pitching literature.

In this paper, we outline the importance of gendered voice in the context of entrepreneurial pitching. Prior literature has suggested that men and women strategically adopt masculine and feminine voice, which allows them to navigate the borders of masculinity and femininity to perform specific tasks (Abdelhay, 2014). Since entrepreneurial pitching is an important phase of an entrepreneurs' journey, we believe entrepreneurial pitching provides a suitable setting to examine how male and female entrepreneurs construct and exhibit masculinity and/or femininity through voice to persuade potential investors. We draw from gender stereotyping and gender role congruence theory to argue that masculinity associated with the entrepreneurial role often puts entrepreneurs who exhibit feminine voices in a disadvantageous position as they are viewed as less capable than entrepreneurs who portray masculine voices. While there is a documented gender bias in entrepreneurship (Bigelow, Lundmark, McLean Parks, & Wuebker, 2014; Shane, Dolmans, Jankowski, Reymen, & Romme, 2012; Thébaud, 2015; Vossenberg, 2013) and investors prefer funding males over females even when they present the same venture pitch (Brooks et al., 2014), understanding how and why these effects occur remains largely unclear.

We propose that the differences in entrepreneurial success between male and female entrepreneurs do not stem from biological differences, rather from a complex set of interactions among entrepreneurs' sex, gender-role identity, and the context, in which the entrepreneur is situated (Kirchmeyer, 1998; Konrad & Cannings, 1997; Tharenou & Conroy, 1994). Using gender stereotyping theory, we argue that masculinity is preferred over femininity in entrepreneurial pitching because entrepreneurship is viewed as a masculine activity (Bruni et al., 2004a: 11; Skelly & Johnson, 2011). However, gender role congruence theory suggests that individuals will be subjected to prejudice, discrimination, and backlash when they fail to conform to the gendered role expectations assigned to them by society. Society has norm and gender driven expectations that assign feminine and communal or caretaker roles to females and masculine and agentic or leader roles to males (Eagly & Wood, 2011; Skelly & Johnson, 2011; Wood & Eagly, 2002, 2012, 2015). As investors are individuals who also hold similar stereotypical gender roles and societal expectations for entrepreneurs (Eagly, 1997), entrepreneurs' failure to conform to these gender role expectations can lead to negative evaluations and perceptions. Hence, we argue that investors are more likely to react positively when there is a congruence between their expectations of gender role and entrepreneurial role among entrepreneurs. We further propose an interactive effect of entrepreneurs' sex and gender voice to untangle the differences in investors' decisions and preferences for role congruent entrepreneurs (i.e. masculine-voiced men and feminine-voiced women) and role incongruent entrepreneurs (feminine-voiced men and masculine-voiced women). This interaction of sex and gendered voice, not clearly specified in any previous research, may be an important determinant of investor' decisions and preferences in light of arguments that female entrepreneurs have a disadvantageous position compared to male entrepreneurs (Balachandra et al., 2013, 2019; Gatewood et al., 2003) and research findings that adopting gender role incongruent behaviors can lead to negative outcomes, backlash, prejudice and discrimination (Eagly & Karau, 2002; Konrad & Cannings, 1997; Rudman, 1998, 1998; Rudman & Glick, 1999, 2001).

In addition to our examination of gendered voice and congruency, we also explore an alternative source of information—gendered products/services offered by the entrepreneurs—that investors can use to blend gender role and entrepreneurial role expectations. Most products and services have dominant genders—some products and services are predominantly identified as more masculine than feminine, or vice versa (Allison, Golden, Mullet, & Coogan, 1980; Fugate & Phillips, 2010; Stafford, 1998). When evaluating an entrepreneur, investors put gender role-based expectations against entrepreneurial role-based expectations by assigning weights to each of the expectations and attempt to blend these expectations by considering other sources of information. We propose that the sex-type or gendered products/services offered by the entrepreneurs can help investors to assign weights and blend these competing expectations. This is because gendered products/services perceptions are just like role-based stereotypical expectations. Gendered products/services perceptions are also automatically activated as these perceptions are also gender stereotypical information. Hence, we propose that the relationship between investors' preferences and evaluations is stronger when there is congruence between the gendered product/service and the entrepreneurs' sex or gendered voice. We further examine the three-way interactive effect of the congruence of entrepreneurs' sex, gendered voice and context, and gendered products/services by examining the differences in investors decisions for role congruent entrepreneurs (masculine-voiced men and feminine-voiced women) and role incongruent entrepreneurs (feminine-voiced men and masculine-voiced women).

We make several noteworthy contributions to the gendered notion of entrepreneurship and the entrepreneurial pitching literature. We contribute to the entrepreneurship literature by providing a fine-tuned analysis of the interactive effects of entrepreneurs' sex and gendered behaviors on investors' decisions. While we know that male and female entrepreneurs differ in terms of gender and entrepreneurial roles, our study explores the meaning of such differences by outlining why these differences occur. In addition, we contribute to the entrepreneurial pitching literature by incorporating a previously overlooked cue, voice, and a previously overlooked context,

the gendered perceptions of the product/services offered by the entrepreneurs, to examine how the congruence between gendered product/service perceptions and entrepreneurs' sex or gendered behaviors influence investors' decisions.

Notably, previous literature has suggested that women should downplay their feminine attributes to better persuade investors and to increase their chances of funding success (Balachandra et al., 2013, 2019; Buttner & Rosen, 1988; Kanze et al., 2018). But entrepreneurs now have access to several novel and emerging financing alternatives such as microfinance, crowdfunding, and peer-to-peer lending for seed capital (Bruton, Khavul, Siegel, & Wright, 2015), hence our work articulates important boundary conditions to this theorizing, especially in the context of early-stage venture funding. Finally, the inclusion of gendered product/service perceptions in analyzing the interactive effect of entrepreneurs' sex and gendered behaviors on investors' decisions can better explain whether and why there are differences in entrepreneurial pitching outcomes between role congruent entrepreneurs (masculine-voiced men and feminine-voiced women) and role incongruent entrepreneurs (feminine-voiced men and masculine-voiced women).

## 3.2 The Acoustic Features of Voice

Humans by nature can produce and process voice even when the speaker uses unknown languages (Latinus & Belin, 2011). Voice has several acoustic characteristics that provide information about speaker's identity, traits, and emotional states (Belin, Fecteau, & Bédard, 2004). As human voice is highly sexually dimorphic, listeners can accurately and easily identify speakers' gender (Pernet & Belin, 2012; Whiteside, 1998). Vocal sounds are the periodic oscillation of the vocal folds that result from the interactions of vocal folds and the vocal tract and there are anatomo-physiological differences in how males and females produce voices (Childers & Wu, 1991). The most well-documented acoustic feature that differs between masculine and feminine voice is the fundamental frequency ($f_0$) or vocal pitch (Andrews & Schmidt, 1997).

Fundamental frequency ($f_0$) or vocal pitch is a function of vocal tract length and reflects the frequency of vibration of the vocal folds (Hatano et al., 2012; Latinus & Belin, 2011). Vocal pitch provides important cues about masculinity and femininity (Feinberg et al., 2005). Several scholars note that males generally have low pitched voices and men with lower-pitched voices are perceived as more attractive, physically stronger, and more dominant than men with relatively higher-pitched voices (Feinberg et al., 2005; Liu & Xu, 2011). On the other hand, females have comparatively high pitched voices and women with higher-pitched voices are perceived as more attractive, whereas lower-pitched female voices are perceived as more dominant, authoritative, and effective for leadership (Anderson & Klofstad, 2012; Cartei et al., 2014; Collins, 2000; Klofstad, 2016; Oguchi & Kikuchi, 1997; Puts, 2005; Puts et al., 2006; Wolff & Puts, 2010; Zuckerman & Miyake, 1993). Research also indicates that women with very high pitched voices are rated as babyish and immature (Borkowska & Pawlowski, 2011).

In addition to Fundamental frequency ($f_0$), formant frequencies ($f_n$) also differ among male and females. Formant frequencies ($f_n$) are the pattern of vocal-fold resonances and they are determined by the length of the vocal tract (the distance from where the glottis sits up to the lips) which is positively correlated with human body size (Fitch, 1997; Fitch & Giedd, 1999). Males with increased vocal tract length or lower formant dispersions have a larger body and are deemed more masculine and older than those with decreased vocal tract length. Both fundamental and formant frequencies have joint and independent effects on participants' assessments of the speakers' body size, masculinity or femininity, and attractiveness (Fitch, 1997; Hatano et al., 2012; Pisanski & Rendall, 2011).

Voice quality is another important factor that helps individuals to differentiate between speakers (Gobl & Chasaide, 1992) and affects the speech properties because of the mode of vibrations of the vocal folds (Laver, 1980). There are differences in the degree and manner of glottal closure, resulting various voice qualities such as modal or healthy voice, breathy, creaky or whispery voices (Imhof et al., 2014). Prior research has suggested that masculine voices are considered deep, thick, and creaky while

feminine voices are considered breathy and warm (Biemans, 1999, 2000; Tielen, 1992). Prior studies have also found that speakers have motivations to express their gender identity of masculinity or femininity through voice. Gender identity is often indexed in voice and listeners make judgements of masculinity and femininity based on these voice cues (Biemans, 1999; Smith, 1985; Weirich & Simpson, 2018). However, both males and females have the option to vary their voice to sound more masculine or feminine or vice versa depending on how the speaker modulates his or her voice (Biemans, 2000). Both biological and social gender is communicated through voice and listening to voices impacts listeners' judgements, hence it is important to account for both biological sex and social gender in communication events (Biemans, 1999).

## 3.3 Theory & Hypotheses

### 3.3.1 The Effect of Gendered Voice on Investment Preference

Ventures pitches provide entrepreneurs an opportunity to seek funds from potential investors. However, there are differences in funding outcomes between male and female entrepreneurs (Brooks et al., 2014). Gender role theory (Bem, 1981) provides explanations regarding why entrepreneurs can be evaluated differently depending on gendered expectations. The theory suggests that societies have culturally allocated and norm-driven expectations about sex-roles that lead to sex-typing, which in turn provides a basis for comparison of individuals based on masculine and feminine attributes. Gender stereotypes also govern what is considered typical or normal regarding how males and females should behave or speak and what voices of particular genders should sound like (Babel & McGuire, 2015).

Entrepreneurs' vocal features have distinct properties that communicate socially relevant, linguistic, and identity information along with information regarding personality traits, age, body size, maturity, physical attractiveness, mood, affective states, competence, credibility, and dominance (Collins & Missing, 2003; DeGroot & Kluemper, 2007; Latinus & Belin, 2011; Pisanski et al., 2012). As voice helps to form perceptions (Berry, 1990; Zuckerman et al., 1991), entrepreneurs' voice plays an

important role in creating first impressions in investors' minds. Based on arguments from gender stereotype theory, investors are also likely to have cultural assumptions regarding how the voice of an entrepreneur should sound during a venture presentation given their experiences. This sex-typing occurs partly from perceivers' readiness to use gender-based schematic processing (Bem, 1981). These gendered expectations and assumptions also influence the classification of different jobs or occupations as masculine and/or feminine (Cejka & Eagly, 1999). Occupations that require such traits as power, leadership, and assertiveness are often viewed as masculine whereas occupations that require such traits as compassion and nurturing are viewed as feminine (Eddleston & Powell, 2008; Karlin, England, & Richardson, 2002; Powell & Butterfield, 2015).

Entrepreneurship has traditionally been viewed as a masculine domain so that the idealized view of an entrepreneur is male (Ahl, 2006; Balachandra et al., 2013; Bird & Brush, 2002; Bruni, Gherardi, & Poggio, 2004b, 2004c). Prior research has also suggested entrepreneurs are perceived more favorably when they display gendered behavior appropriate to entrepreneurship during venture presentations (Balachandra, Briggs, Eddleston, and Brush, 2019 2019). More specifically, as entrepreneurs are viewed as leaders and require more agentic qualities, entrepreneurship has been constructed as a masculine activity (Bruni et al., 2004a: 11; Skelly & Johnson, 2011). The gender-based stereotyping of entrepreneurs views entrepreneurial activities as more masculine than feminine (Ahl, 2006; Collins & Moore, 1964; Lewis, 2006) and results in a normative masculine model that associates entrepreneurial achievements predominantly to male entrepreneurs, thereby, putting female entrepreneurs in a disadvantageous position (Balachandra et al., 2013; Eagly & Karau, 2002; Marlow & Patton, 2005a, 2005b). Hence, entrepreneurship is a cultural model of masculinity (Bruni et al., 2004a: 6) and being a successful entrepreneur means that the entrepreneur has learned to competently perform entrepreneurial activities and to exhibit gender behavior appropriate to entrepreneurship (Bruni et al., 2004a: 2). As investors have gendered and stereotypical assumptions and expectations about how entrepreneurs

should act, behave, sound, and respond to queries during venture pitches (Balachandra et al., 2013; Kanze et al., 2018; Marlow & Patton, 2005a), entrepreneurs' gender-stereotypical behaviors influences investors' perceptions and evaluations (Balachandra et al., 2019). As investors are driven by their gender-stereotyped assumptions and expectations regarding entrepreneurship, we suggest that investors are more likely to perceive entrepreneurs who speak in a masculine voice as more competent and dominant than those who speak in a feminine voice. Investors are more likely to have positive perceptions and make positive evaluations when entrepreneurs display masculine-stereotyped behaviors because of the masculinity attached to entrepreneurship. Accordingly, we hypothesize:

> **H1**: *Speaking in a masculine (feminine) voice by entrepreneurs during a venture pitch is positively (negatively) related to investor preference.*

### 3.3.2 The Moderating Effect of Entrepreneurs' Sex

The perspective of entrepreneurship as a stereotypically masculine career (Ahl, 2006; Gupta, Turban, & Bhawe, 2008; Lewis, 2006) leads to a prominent and consistent gender gap in entrepreneurship—there are more male entrepreneurs than female entrepreneurs around the world (Acs, Arenius, Hay, & Minniti, 2005). Prior researchers have also documented gender differences in entrepreneurial activity and intentions (Gatewood et al., 2003; Gupta et al., 2008; Gupta, Turban, Wasti, & Sikdar, 2009; Reynolds, Bygrave, & Autio, 2003) and have suggested that stereotypical beliefs regarding entrepreneurship impact entry and development of female entrepreneurs (Marlow & Patton, 2005b). Prior researchers have also established the fact that compared to female entrepreneurs, male entrepreneurs are more often viewed as exemplars or role models (Balachandra et al., 2013; Bird & Brush, 2002; Gupta et al., 2009), more visible and celebrated in the media (Ahl, 2006; Baker, Aldrich, & Nina, 1997; Balachandra et al., 2013) and perceived as more authoritative, dominant, and powerful; they also enjoy higher status than female entrepreneurs (Barreto, Ryan, & Schmitt, 2009). Moreover, female entrepreneurs face barriers in securing finance from

both formal and informal sources and these barriers are related to their gender (Marlow, 2002; Marlow & Patton, 2005; Sara & Peter, 1998). In addition, investors prefer male entrepreneurs over female entrepreneurs in early-stage funding decisions as venture capitalists tend to apply male-oriented beliefs, rules, and practices and view female entrepreneurs as ill-suited to negotiate, strike, and structure a deal (Greene, Hart, Gatewood, Brush, & Carter, 2003; Marlow & Patton, 2005a, 2005b). Furthermore, both scholars and investors have a tendency to view female-owned businesses as small and less important while they view male-owned business as fast-growing, large, profitable, and important (Baker et al., 1997; Balachandra et al., 2013; Brush, Carter, Gatewood, Greene, & Hart, 2006; Lewis, 2006).

Given societal attitudes and the associated outcomes of these attitudes as they relate to entrepreneurship, entrepreneurs themselves subconsciously become influenced by the gendered beliefs which subsequently limit women entrepreneurs' growth and reinforces these stereotypical notions in self-employment. For example females face patriarchal pressures that affect their entrepreneurial experiences from the very beginning (Marlow, 1997) and are more likely to have smaller and less profitable ventures than males (Carter & Williams, 2003; Carter, Anderson, & Shaw, 2001; Gupta et al., 2009). In addition, female entrepreneurs also assign more weight to masculine attributes in defining a successful entrepreneur (Fagenson & Marcus, 1991). So, the gendered notion of entrepreneurship affects the kind of ventures male and female entrepreneurs establish and their ventures' subsequent development and growth (Gupta et al., 2009).

A natural question of this research is to ask whether female entrepreneurs can overcome the gender bias documented in prior literature. Investors have shown a preference for elevator pitches presented by male entrepreneurs than the elevator pitches presented by female entrepreneurs even when the content of an elevator pitch is the same (Brooks et al., 2014). If entrepreneurship is primarily viewed as a masculine endeavor, then a female who demonstrates male characteristics may be viewed as more capable and authoritative. A female exhibiting a deeply masculine voice in a pitch, for

example, might alter assessments of potential investors and create a positive impression. Theory on gender stereotype, however, would tend to undermine this conjecture. Individuals possess cultural assumptions about how males and females should behave or speak. This results in dominant stereotypes indicating that listeners have norm-driven and cultural expectations about how male and female voices should sound. The stereotypical view of voice relies on what is typical or normal and measures how listeners match their norm-driven expectations and cultural assumptions of what voices sound like. For example males are expected to have lower-pitched voices while females are expected to have higher-pitched (Borkowska & Pawlowski, 2011; Jones et al., 2010) and breathy voices (Henton & Bladon, 1985). Male and female vocal features differ in a predictable manner, so listeners are consistently able to accurately identify the gender of speakers using vocal cues only (Sachs, Lieberman, & Erickson, 1973). Also, both male and female listeners have equally strong stereotypical expectations regarding speakers' voices and the congruency of the speakers' voices with the information provided by the speaker (Lattner & Friederici, 2003).

This gender stereotyping of voice posits that males and females should meet the expectations regarding voice during communications with investors (Burgoon & Hale, 1988). Accordingly, investors should have positive evaluations and preferences for entrepreneurs who meet investors' expectations regarding gender role even when they are being evaluated for their entrepreneurial role. In other words, males (females) with feminine (masculine) voices would create a discordance for potential investors since this would go against the gender stereotype and this should lead to lower evaluations of an entrepreneurial pitch compared to the situation where voice is more consistent with gender during the pitch. We expect that there is an interactive effect of sex and gendered voice on investors' preferences and choices (O'Reilly & O'Neill, 2004; Powell & Butterfield, 2003). Accordingly, we propose:

> **H2**: *The relationship between entrepreneurs' voice and investment preference is moderated by entrepreneurs' sex such that the relationship*

*becomes more positive when there is a congruity between entrepreneurs' voice and sex that is investors prefer ventures pitched by men (women) who speak in a masculine (feminine) voice than those by men (women) who speak in a feminine (masculine) voice.*

### 3.3.2 The Interactive Effect of Entrepreneurs' Sex, Gendered Voice and Gendered Services

Motivated by the work on gender schema and gender role (Bem, 1974, 1981), several researchers have examined whether products/services have gender and found that most products/services have sex-typed identities that help consumers to adopt and use the products (Iyer & Debevec, 2015; Milner & Fodness, 1996; Milner, Speece, & Anderson, 1990; Stern, 1988; Stern, Tewari, & Gould, 1993). Products/services that are considered to have sex-typed identities are normally viewed as gender dominant (Allison et al., 1980; Alreck, Settle, & Belch, 1982; Bellizzi & Milner, 1991; Golden, Allison, & Clee, 1979; Leidner, 1991; Stafford, 1998). Researchers have found that congruence between the providers' sex and sex-typed products/services lead to more positive perceptions and attitudes towards the provider because it enables an implicit matching of characteristics between the provider/source and the product/service (Iacobucci & Ostrom, 1993; Kanungo & Pang, 1973; Leidner, 1991; Mohr & Henson, 1996; Stafford, 1998; Whipple & Courtney, 1985).

Investors can also avail product gender congruence information readily when they attempt to blend the gender and entrepreneurial role-based expectations as such product gender congruence is also gender stereotypical information. While entrepreneurship is viewed as a masculine job, some aspects of the entrepreneurial role can be more congruent with femininity depending on the context (Eagly, Johannesen-Schmidt, & Van Engen, 2003). One such context occurs when entrepreneurs seek funding for gendered products/services. When there is some form of congruence between the entrepreneurs' sex or gendered voice and the type of products/services they are offering, this can lessen the incongruity between the gender role and entrepreneurial

role. We argue that while investors prefer ventures pitched by males as males conform to the masculine identity of entrepreneurship, the relationship will be stronger when males pitch about a masculine product/service compared to when males pitch about a feminine product/service. Similarly, as investors have gendered expectations about how male and female entrepreneurs should act, behave, sound and respond to queries during elevator pitches (Balachandra et al., 2013; Kanze et al., 2018; Marlow & Patton, 2005a), investors prefer ventures when entrepreneurs display masculine behaviors compared to feminine behaviors. Hence, we suggest that potential investors will prefer ventures pitched by masculine voice more when the entrepreneur pitches about a masculine product/service compared to when an entrepreneur pitches about a feminine product/service. We also argue that investors are more likely to change their attitudes and evaluate the entrepreneurs positively when role-congruent entrepreneurs (masculine-voiced men and feminine-voiced women) provide venture pitch about a congruent gendered product/service. Accordingly, we hypothesize:

> **H3a**: *The relationship between entrepreneurs' sex and investment preference is moderated by gendered services such that the relationship becomes more positive when there is a congruity between entrepreneurs' sex and gendered services.*

> **H3b**: *The relationship between entrepreneurs' voice and investment preference is moderated by gendered services such that the relationship becomes more positive when there is a congruity between entrepreneurs' voice and gendered services.*

> **H3c**: *Investors are more likely to prefer ventures pitched by men (women) in a masculine (feminine) voice, as compared to feminine (masculine) voice, but only when they offer a masculine (feminine) service.*

## 3.4 Methods

### 3.4.1 Participants

We recruited 203 financially literate participants from a US university to take part in the study ($M_{Age}$ = 18.58, $SD_{Age}$ = 0.77, 65% male). We used filter questions at the beginning of the survey to ensure that participants are generally aware of the entrepreneurial funding process and entrepreneurial investment decision-making. We removed 8 participants who failed to answer or incorrectly answered the filter questions and attention checks for a final sample of 195 financially literate participants as proxies for amateur individual investors.

### 3.4.2 Research Design

We explore the relationship between sex, gendered voice, and gendered service using a sample of business students as a proxy for amateur individual investors. We test our hypotheses across two studies. We first pilot tested our model using a sample of graduate students and finally use randomly selected participants from a sample of business students to pre-test our model. We use a 2×2×2 (Gendered Voice: *Masculine, Feminine* × Speakers' Sex: *Male, Female* × Gendered Service: *Masculine, Feminine*) fully crossed, between-subject, factorial design.

### 3.4.3 Procedure

The experiment was conducted in a controlled lab environment. After participants arrived at the lab, they were briefly instructed about the tasks. They were asked to take a seat in front of their assigned computers. Participants were provided with headphones and a 4-digit code to unlock the survey. After participants provided informed consent to take the survey, they were randomly assigned to one out of the eight experimental conditions. They first saw a photo of the entrepreneur and read some background information about the entrepreneur. Participants then were instructed to listen to the elevator pitch by clicking a button on the Qualtrics webpage. Participants

listened to the randomly presented audios with manipulations of gendered voice and service and they were required to remain on the page that contained the audio of the funding pitch for the entire duration of the pitch, as the Qualtrics questionnaire did not become available until the completion of the pitch. After listening to the audios, they completed the survey in which they indicated their perceptions of passion, warmth and competence of the entrepreneur, their willingness to fund the venture and their gender identity. Participants also completed instructional manipulation checks and answered factual questions about the venture pitch content to discern inattention and satisficing behavior (Oppenheimer, Meyvis, & Davidenko, 2009). Participants were required to answer all questions in each section and were not allowed to return to a previous section after its completion. Participants were also instructed not to adjust the volume audio presented to them by altering the volume of the headphones or computer. Thus, we control for all potential confounds through random assignment and participants received the identical funding instructions across all conditions suggesting that the differences in funding decisions can be attributed to the carefully controlled manipulations (Antonakis et al., 2010; Cook, Campbell, & Shadish, 2002; Johnson, Stevenson, & Letwin, 2018).

### 3.4.4 Materials and Manipulations of Gendered Voice

We manipulated the service offered and voice used by male and female entrepreneurs by creating eight funding pitch audios corresponding to the treatment groups. Materials for the stimulus venture pitches were collected from actual Kickstarter videos. As cleaning services is predominantly viewed as feminine and auto-repair is predominantly viewed as masculine services (Stafford, 1998), we collect two moderately successful venture pitches from Kickstarter, in which both the entrepreneur offered a system that people can use to schedule cleaning or auto-repair services from the convenience of their homes. We modified the script of the venture pitches and kept the funding requirements, growth forecasts, and break-even points identical across the two pitches. Hence, the two pitches were identical in terms of financial content but differed in terms of the gendered services the entrepreneur is offering. To record our

venture pitches, we recruited two volunteers, who biologically identify as heterosexual male and female. To ensure that there were no potential confounds, we ensured that the volunteers were native speakers of equal age and the same race with no discernible accent.

After the venture pitches were recorded, we analyzed the acoustic features of the recorded voices using Praat. The analyses from Praat suggest that the mean vocal pitch of the female speaker is 225 Hz and that for the male speaker is 118 Hz. Then we used the STRATGHT package (Kawahara, 2003; Kawahara, Cheveigné, Banno, Takahashi, & Irino, 2005) in MATLAB to perform voice morphing. STRAIGHT instantly performs spectral smoothing of the provided sample by separating the contributions of glottal source and supra-laryngeal filtering to the voice signal. So, each voice sample is represented as a time-series data. STRAIGHT decomposes voice signals into several vocal parameters— fundamental frequency or $f_0$, duration, amplitude, spectro-temporal density, and aperiodicity—each of these vocal cues can be independently manipulated from one another. We identify the time-frequency landmarks following Pernet and Belin (2012). The first and second formants at the beginning of phonation, the formant transition, and end of phonation were selected as spectro-temporal anchors and the onset of sounds, offset, and initial burst of sounds were set as the anchor points. The voice signals are resynthesized from the stimulus sample by using a logarithmic interpolation of fundamental frequency or $f_0$ and amplitude (Pernet and Belin, 2012; Bruckert et al., 2010). Hence, we create morphed voices that sound natural by interpolating from these time-frequency landmark templates for male and female voices (Pernet & Belin, 2012). Thus, we used STRAIGHT to create voices that are masculine (resynthesized male voice) and feminine (resynthesized female voice) and are close to the average prototypical voice for males and females. The average pitch of the resynthesized male voice is 120.16 Hz (prototypical average pitch for male speaker is 121 Hz; Bruckert et al., 2010) and the average pitch of the resynthesized female voice is 213.50 Hz (prototypical average pitch for female speaker is 213 Hz; Bruckert et al., 2010). Then,

we used audacity and STRAIGHT to morph the audios to create gender-interpolated voices for males and females following Pernet and Belin (2012).

We pilot tested the gendered voice and service manipulations extensively to ensure that there were no potential confounds and that the manipulations were salient. We recruited and randomly assigned participants to one of the eight treatment conditions. We asked participants to classify the gendered voices and services; we also added questions to detect inattention and satisficing response behavior. Results from this first pilot test with a convenience sample of 55 graduate students ($M_{Age}$ = 38.15, $SD_{Age}$ =2.12, Female = 38%) demonstrated the effectiveness of the gendered voice and service manipulations, as all participants were able to correctly classify the gendered voices. Also, nearly all participants (98.18%) were able to correctly classify the gendered services. Additionally, mean comparison tests showed there were no significant difference between the attractiveness levels of the two ventures. That is participants across both the business ideas found them equally attractive. Participants also rated the physical attractiveness of the photos and there was no significant difference between the attractiveness of the male and female photos. After the completion of the pilot survey, participants were asked to complete a follow-up questionnaire in which they were asked to indicate if they found the voices mechanical or computer generated and whether they understood the pitch. None of the participants revealed that they found the voices mechanical and all participants indicated that they understood the pitch.

To further check the efficacy of our gendered voice and service manipulations, we collect responses to our materials from 101 MBA students ($M_{Age}$ = 36.44, $SD_{Age}$ =8.29, Female = 42%) recruited from a US university. We randomly assigned participants to listen to one of the eight venture pitches and to rate the voices and services as masculine or feminine. We also included factual questions regarding the content of the funding pitches and attention check questions to detect inattentive participants. We found that 99% of participants correctly classify the gendered services

and 98% of participants correctly rated the entrepreneurs' gendered voice. These results suggest that our manipulations were effective.

### 3.4.5 Measures

#### *3.4.5.1 Dependent Variables*

##### *3.4.5.1.1 Investment Preference*

We measure investment preference using propensity to invest (Clarke et al., 2018; Huang & Pearce, 2015). This 5-item scale incorporates both intention and willingness to invest in the venture. Participants first rated the 4-item investment intention scale using a Likert type scale (1 = strongly disagree to 5 = strongly agree). Then they indicated the likelihood of investing in the venture using a 11-point scale anchored at 0 (0% chance) to 10 (100% chance). We performed a principal component analysis to see if the five items are measuring a common underlying construct. The results suggest that all the items had loadings > 0.81 and all items loaded significantly on a single component with an eigenvalue of 2.857 that explained 83.2% of the variance. Following Clarke *et al.*, (2018) we standardized and combined the intentions and investment likelihood in a single summative scale to measure investors' investment preferences.

Second, we employ an alternative measure of investment preference through willingness to fund in terms of dollar amounts. We measured participants' intended funding amount by asking how much they will fund this venture if they have free cash in hand (Li et al., 2017).

#### *3.4.5.2 Independent Variables*

The three independent variables are the manipulations of entrepreneurs' sex, gendered services, and gendered voice. Sex manipulation is coded as 1 for males and 0 for females. Gendered voice manipulation is coded as 1 for masculine voice and 0 for feminine voice. Gendered service manipulation is coded as 1 for masculine service and 0 for feminine service.

*3.4.5.3 Controls*

Participants provided their demographics, rated the attractiveness of the voice, physical attractiveness of the presenter, perceived passion and preparedness (Chen et al., 2009), warmth and competence (Bergmann, Eyssel, & Kopp, 2012) and reported their gender identity [Bem Sex-Role Identity (BSRI scale)]. Participants also provided a measure of their current affective state.

## 3.5 Results

### 3.5.1 Manipulation Checks

Responses to the manipulation-check questions indicate that all manipulations were successful. Almost all the participants correctly identified the randomly assigned manipulations of gendered voice and services. Three participants failed to correctly identify the gendered voices. As removing these participants does not influence results, we present results including these participants. Therefore, our manipulation of gendered voice and services was successful. Also, two participants reported having a hearing impediment. However, excluding the participants who reported having a hearing impediment does not affect the results. Therefore, analyses include these participants. Participants rated the attractiveness of both the ventures using a Likert type scale (1 = very unattractive to 5 = very attractive) and there was no significant difference between the mean attractiveness of the ventures ($Mean_{Diff}$ = 0.0289, T-Stat = 0.6945, *p-value* = 0.4882). Also, participants rated the attractiveness of the entrepreneurs' photos and there was no significant difference between the mean physical attractiveness of the male and female entrepreneurs ($Mean_{Diff}$ = 0.0136, T-Stat = 0.3175, *p-value* = 0.7512). Means, standard deviations, and intercorrelations between the study variables are presented in Table 3.1.

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Insert Table 3.1 about here

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To assess the degree of multicollinearity, we computed the variance inflation factor (VIF) of each independent variable and found that all the VIFs were less than 1.16, which is far below the threshold VIF level of 4 (Hair et al., 1998), indicating that our model estimations do not suffer from a multicollinearity bias.

### 3.5.2 Hypothesis Tests

We ran a three-way analysis of variance to test our hypotheses. H1 proposes that there is a significant effect of gendered voice on investment preference. The results of the three-way ANCOVA is presented in Table 3.2.

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Insert Table 3.2 about here

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As hypothesized, we find a significant effect of gendered voice on investment preference (F= 6.493, p= 0.012). The simple contrast between masculine and feminine voice suggests that masculine voice is preferred over feminine voice (contrast estimate=0.328, SE =0.129, p=0.012). Although not hypothesized, we find that the effect of entrepreneurs' sex on investment preference is only marginally significant (F=3.447, p=0.065) and the effect of gendered service on investment preference is also significant (F=4.217, p=0.041). H2 predicts an interactive effect of entrepreneurs' sex and gendered voice on investment preference. The interaction of entrepreneurs' sex and gendered voice is significant, thus revealing a significant interaction effect of our independent variable of interest, *Sex* × *Gendered Voice*, on *investment preference* (F=9.295, p=0.003). Simple-effects tests indicate that investment preference is significantly greater when participants listened to the male entrepreneur who presented the funding pitch in a masculine voice than when participants listened to a female entrepreneur who presented the funding pitch in a masculine voice (F=6.408, p=0.012). In addition, there is a significant difference for investment preference between male and female entrepreneurs in the feminine voice condition. Investment preference is significantly greater when the female entrepreneur presented the funding pitch in a

feminine voice than when the male entrepreneur presented the funding pitch in a feminine voice (F=5.122, p=0.025).

H3a proposes an interactive effect of entrepreneurs' sex and gendered services on investment preference. The interaction of entrepreneurs' sex and gendered services is significant, thus revealing a significant interaction effect of our independent variable of interest, *Sex* × *Gendered Service*, on *investment preference* (F=4.718, p=0.031). Simple-effects tests indicate that investment preference is significantly greater when the female entrepreneur presented the feminine-type service than when the male entrepreneur presented the feminine-type service (F=5.629, p=0.019). However, there is no significant difference for investment preference between male and female entrepreneurs in pitching the masculine-type service (F=0.339, p=0.561). H3b proposes an interactive effect of entrepreneurs' gendered voice and services on investment preference. The interaction of entrepreneurs' gendered voice and services is significant, thus revealing a significant interaction effect of our independent variable of interest, *Gendered Voice* × *Gendered Service*, on *investment preference* (F=8.447, p=0.004). Simple-effects tests indicate that investment preference is significantly greater when the masculine-type service is presented in a masculine voice than when the feminine-type service is presented in a masculine voice (F=4.379, p=0.038). In addition, investment preference is significantly lower when the masculine-type service is presented in a feminine voice than when the feminine-type service is presented in a feminine voice (F=5.839, p=0.017). Finally, H3c proposes an interactive effect of entrepreneurs' sex, gendered voice, and gendered services on investment preference. The results from the three-way ANCOVA suggest that the three-way interaction term, *Sex*× *Gendered Voice* × *Gendered Service* is significant, suggesting that there is an interactive effect of entrepreneurs' sex, gendered voice, and gendered services on investment preference (F=5.974, p=0.015). The three-way interaction is plotted in Figure 3.2.

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Insert Figure 3.2 about here

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The interaction of gendered voice by gendered service for the male entrepreneur suggests that investment preference is significantly higher when the male entrepreneur presents a masculine idea in a masculine voice than in a feminine voice. Also, for the male entrepreneur, investment preference is greater when the male entrepreneur presents a feminine idea in a masculine voice than in a feminine voice. However, the figure suggests that for the male entrepreneur, investment preference is significantly higher when the male entrepreneur presents a feminine idea in a feminine voice than when the male entrepreneur presents a masculine idea in a feminine voice.

Conversely, for the female entrepreneur, investment preference is significantly lower when the female entrepreneur presents a feminine idea in a masculine voice than in a feminine voice. For the female entrepreneur, investment preference is significantly higher when the female entrepreneur presents a masculine idea in a masculine voice than in a feminine voice. However, the figure suggests that for the female entrepreneur, investment preference is significantly higher when a female entrepreneur presents a feminine idea in a feminine voice than when a female entrepreneur presents a masculine idea in a feminine voice.

The interaction effect of entrepreneurs' sex, gendered voice, and gendered services on investment preference suggests that a congruity between gendered voice and service has a significant influence for both male and female entrepreneurs. While masculine voice is preferred overall in the entrepreneurial pitching context, the interaction of entrepreneurs' sex, gendered voice, and gendered services suggest that pitching a feminine idea in a masculine voice has detrimental effects for female entrepreneurs. Similarly, pitching a masculine idea in a feminine voice has detrimental effects for male entrepreneurs. Combined, these results suggest that displays of masculine behavior during entrepreneurial pitching is not always beneficial as outlined in prior literature. There are boundary conditions to this theorizing as we find that the benefits of displaying masculinity while pitching may depend on the type of gendered services that the entrepreneur is offering.

### 3.5.3 Robustness Tests

We utilize an alternative measure of investment preference, willingness to fund, to further examine the effect of entrepreneurs' sex, gendered voice, and gendered services on investment preference. These results are presented in Table 3.3.

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Insert Table 3.3 about here

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The results suggest a significant effect of gendered voice on investment preference (F= 11.782, p= 0.001), supporting H1. The simple contrast between masculine and feminine voice suggests that masculine voice is preferred over feminine voice (contrast estimate=1.092, SE =0.248, p=0.000). We also find that sex moderates the effect of gendered voice on willingness to fund (F= 8.594, p= 0.004), thus supporting H2. Simple-effects tests indicate that willingness to fund is significantly greater when participants listened to the male entrepreneur who presented the funding pitch in a masculine voice than when participants listened to the female entrepreneur who presented the funding pitch in a masculine voice (F=4.203, p=0.042). Also, willingness to fund is significantly greater when the female entrepreneur presented the funding pitch in a feminine voice than when then male entrepreneur presented the funding pitch in a feminine voice (F=13.755, p=0.000). We also find that gendered services moderate the effect of sex on willingness to fund (F= 4.527, p= 0.035), thus supporting H3a. Simple-effects tests indicate that there is no significant difference for willingness to fund between male and female entrepreneurs in pitching the masculine-type service (F=0.355, p=0.552). However, willingness to fund is significantly greater when the female entrepreneur presented a feminine-type service than when the male entrepreneur presented a feminine-type service (F=5.100, p=0.025). We also find a significant interactive effect of gendered voice and gendered service on willingness to fund (F=67.816, p=0.000). Further investigation of the simple effects suggests that that willingness to fund is significantly higher when the masculine-type service is presented in a masculine voice than when a feminine-type service is presented in a masculine

voice (F= 39.804, p=0.000). In addition, willingness to fund is significantly lower when the masculine-type service is presented in a feminine voice than when the feminine-type service is presented in a feminine voice (F=70.933, p=0.000). Finally, the interactive effect of entrepreneurs' sex, gendered voice, and gendered services on willingness to fund is significant (F=5.125, p=0.025). The interactive effect of entrepreneurs' sex, gendered voice, and gendered services on willingness to fund is plotted in Figure 3.3 and Figure 3.4.

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Insert Figure 3.3 and 3.4 about here

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The figure suggests that willingness to fund is higher when males pitch a masculine idea in a masculine voice and when males pitch a feminine idea in a feminine voice. Overall, a masculine voice results in higher willingness to fund for male entrepreneurs. On the other hand, willingness to fund is higher for females when females pitch a feminine idea in a feminine voice than when females pitch a feminine idea in a masculine voice. These results provide further support to our theorizing that displaying masculine behavior during venture pitching depends on the context as female entrepreneurs can experience a negative impact if they portray masculinity while pitching a feminine-type service.

### 3.5.4 Additional Analysis

We also investigate the effect of entrepreneurs' sex, gendered voice, and gendered services on investment choice. We measure investment choice by asking participants to allocate $50 into the business or into a second alternative investment option. We asked participants to assume that they had $50 free cash to make a small investment and asked them to indicate if they would like to invest it in the business advocated by the entrepreneur or in a money market mutual fund (Johnson *et al.*, 2018). Choice was coded as 1 if participants chose to invest in the business advocated by the

entrepreneur and 0 if they chose to invest in the money market mutual fund. We conducted a binary logistic regression analysis to test the effect of our predictors on investment choice. These results also suggest that entrepreneurs' voice significantly influences investment choice (Wald = 19.516, $p$ = 0.000). The odds ratio is 4.742, suggesting that listening to funding pitches in masculine voice corresponds with higher odds of being chosen as the investment. The odds of people in the masculine voice condition are almost five times as likely to receive investment than those in the feminine voice condition. We also found a significant interactive effect of entrepreneurs' gendered voice and gendered service on investment choice (Wald = 7.696, $p$ = 0.006). The odds ratio suggests that when participants listened to feminine services, the odds of choosing to invest in the new company pitched by the entrepreneur are almost three times greater for feminine voice than for masculine voice. Also, the odds ratio suggests that when participants listened to masculine services, the odds of choosing to invest in the new company pitched by the entrepreneur are almost eight times greater for masculine voice than for feminine voice. We also find support for the interactive effect of entrepreneurs' sex and gendered voice (Wald = 7.531, $p$ = 0.006). The odds ratio suggests that the odds of people who listened to males in a masculine voice are almost sixteen times as likely to invest in the entrepreneur's venture than those who listened to females in a masculine voice. In addition, the odds of choosing to invest in the new company pitched by the females are almost three and a half time greater when females speak in a feminine voice than a masculine voice. Similarly, the odds of choosing to invest in the new company pitched by the males are almost eleven and a half times greater when males speak in a masculine voice than a feminine voice. Finally, the interaction of entrepreneurs' sex and gendered service is significant (Wald = 11.609, $p$ = 0.000). The odds ratio suggests that the odds of people who listened to females pitching a feminine service are almost one and a half times greater to invest in the female entrepreneur's venture than those who listened to females pitching a masculine service. Also, the odds of people who listened to males pitching a masculine service are one and a half times greater to invest in the male entrepreneur's venture than those who listened

to males pitching a feminine service. The three-way interactive effect of entrepreneurs' sex, gendered voice, and gendered services on investment choice is also significant (Wald = 5.581, $p = 0.018$) suggesting that there is an interactive effect of our predictors on investment choice.

## 3.6 Discussion

Based on a controlled experiment, our findings extend current research on how entrepreneurs influence investors' judgements through their voice in a funding pitch. Our results suggest that gendered voice has a significant effect on investment preference both in terms of propensity and willingness to invest. We find that participants are more likely to invest in ventures that are presented in a masculine voice. Our results also highlight a key factor— the notion of gendered services that prior research has failed to incorporate while examining the effect of gender stereotypes on entrepreneurial outcomes. Researchers investigating gender bias in entrepreneurship has suggested that portraying masculinity is beneficial in venture pitch presentations (Balachandra *et al.*, 2013, 2019; Buttner and Rosen, 1988; Kanze *et al.*, 2018), however, we find that such benefits are only available when entrepreneurs pitch masculine-type services. While masculinity is preferred in venture pitch presentations, in case of pitching feminine-type services, femininity is preferred over masculinity. We document this effect even for male entrepreneurs when they pitch feminine-type services. These results intriguingly suggest that information that is conveyed in a funding pitch through gendered voice and services may have a higher impact than the biological sex of the entrepreneurs.

Thus, we provide evidence that the wholesale adoption of masculinity and aggressiveness can lead to negative outcomes for female entrepreneurs as such portrayal of masculinity contradicts with investors' gender role stereotypes. Furthermore, male entrepreneurs can benefit by demonstrating femininity while pitching for a feminine-type service. Hence, we find that, instead of being swayed by the entrepreneurs' biological sex, potential investors often match their stereotyped expectations with what

and how the entrepreneur is presenting. Our results, thus, outlines important boundary conditions surrounding gender bias in entrepreneurial contexts.

### 3.6.1 Implications of the Research

Our research findings have important implications for research on gender bias in entrepreneurship. While there is a documented gender bias in entrepreneurship literature, our findings suggest that the role and effect of entrepreneurs' biological sex on entrepreneurial outcomes may have been overemphasized. We find that the interactions of entrepreneurs' sex, gendered behaviors, service types influence investors' judgments and decisions. Hence, a contextually driven approach is needed in future research to provide a more nuanced understanding of how gender role bias or stereotypes impact the outcomes of numerous entrepreneurial tasks and communicative interactions. Entrepreneurial scholars have often embarked at the outset on the theoretical assumption that investors have systematic biases against femininity and masculinity is associated with entrepreneurial competence (Balachandra *et al.*, 2019; Brush *et al.*, 2018). Depending on the context, however, this may not necessarily be always true. Though masculinity is preferred over femininity, our results highlight important boundary conditions to these findings and demonstrate that investors prefer femininity over masculinity for pitching a feminine business idea.

Our study also has implications for the emerging stream of research investigating the role of verbal and non-verbal behaviors on investors' judgements and decision-making. We highlight an entrepreneurs' portrayal of masculinity and femininity through voice as a critical form of non-verbal behavior that influences investors' evaluations of business opportunities. Our results thus propound the need for further study regarding the impact of numerous verbal and non-verbal behaviors, including expressive behaviors or gestures on pitch success.

### 3.6.2 Limitations and Future Research

In our study, we focused only on the effect of gendered voices on investment preference. However, funding success and investors' willingness to invest are often

influenced by entrepreneurs' facial expression, display of joy, and gesturing (Clarke et al., 2018; Jiang et al., 2019). As we provided only audio of the pitch presentations, subjects were not able to evaluate the funding pitches through several verbal and non-verbal expressions. Although we did not study the effect of these verbal and non-verbal expressions on investment preference, this would be a worthy research for future. Showing which verbal and non-verbal cues influence entrepreneurial outcomes and examining the joint effect of Entrepreneurs' gendered voice and facial expressions on funding success could give us a deeper understanding of how these verbal and non-verbal cues influence investors' judgments, perceptions, and decisions.

Our results also unfold other promising avenues for future scholarly research. We found that there is an interactive effect of entrepreneurs' biological sex, gendered voice, and sex-typed products on investors' willingness to fund the venture. We also reported that investors are more likely to invest in a venture when there is a congruence between the entrepreneur's voice and the sex-typed services/products that the entrepreneur is offering. As individuals often portray gender through voice, we found that the congruent entrepreneur who is pitching for a masculine (feminine) service/product in a masculine (feminine) voice is more successful than the incongruent entrepreneur who is pitching for a masculine (feminine) service/product in a feminine (masculine) voice. These findings suggest that investors are not biased against female entrepreneurs, rather, investors' decisions are influenced by the combined effect of entrepreneurs' biological sex, gendered voice, and sex-typed products. Future research can unravel how investors' gut-feeling, emotions, mental state, cognitive processes affect the interactive effect of entrepreneurs' biological sex, gendered voice, and sex-typed products on investment preference. Future research can also explore the factors that negate the beneficial effect of the congruence between entrepreneur's voice and the sex-typed products. For example, non-native accent may distract investors and impact their decision-making even when there is congruence between entrepreneurs' biological sex, gendered voice, and sex-typed products.

## 3.7 Conclusion

Ventures pitches provide entrepreneurs an opportunity to seek funds from potential investors. As societies have culturally allocated and norm-driven expectations about sex-roles, entrepreneurial activities have often been viewed as more masculine than feminine. The gender-based stereotyping of entrepreneurs has put female entrepreneurs in a disadvantageous position and female entrepreneurs have been advised to display masculine behaviors during pitching a venture idea to potential investors. However, female entrepreneurs can be subjected to discrimination and backlash when they portray masculinity as that would violate investors' expectations regarding gender roles. Hence, we identified the product/service gender as a source of information that investors can use to blend their gender role and entrepreneurial role related expectations. Using a controlled lab experiment, we find that investors are more likely to invest in a venture when there is a congruence between the entrepreneur's gendered voice and advocated sex-typed services/products offered by the entrepreneur. We find that while masculinity is preferred in entrepreneurial pitching, there are boundary conditions to this theorizing suggesting that the benefits of displaying masculinity while pitching may depend on the type of gendered services/products offered by the entrepreneur.

CHAPTER TABLES AND FIGURES

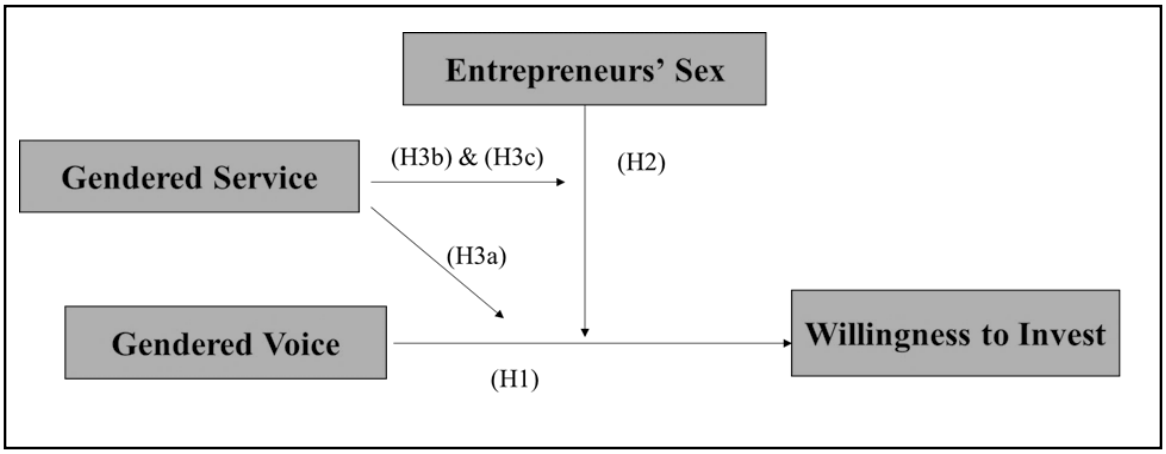


**Figure 3.1:** Conceptual Model of Gendered Voice

**Table 3.1:** Descriptive Statistics and Correlations

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Investment Preference[a] | 0.00 | 1.00 | 1.00 | | | | | | | | | | | | | | | | | | |
| 2. Willingness to Fund | 4.83 | 2.19 | .31** | 1.00 | | | | | | | | | | | | | | | | | |
| 3. Choice | 0.59 | 0.50 | .08 | .13 | 1.00 | | | | | | | | | | | | | | | | |
| 4. Entrepreneurs' Sex | 0.50 | 0.50 | .02 | .07 | .12 | 1.00 | | | | | | | | | | | | | | | |
| 5. Gendered Voice | 0.50 | 0.50 | .18* | .05 | -.05 | -.13 | 1.00 | | | | | | | | | | | | | | |
| 6. Gendered Service | 0.50 | 0.50 | -.09 | -.06 | -.09 | -.11 | -.13 | 1.00 | | | | | | | | | | | | | |
| 7. Listeners' Sex | 0.65 | 0.48 | .07 | .12 | .01 | .09 | .01 | -.04 | 1.00 | | | | | | | | | | | | |
| 8. Hearing Impediment | 0.01 | 0.10 | -.01 | -.02 | .13 | .00 | .10 | .10 | -.03 | 1.00 | | | | | | | | | | | |
| 9. Familiarity | 0.97 | 0.82 | .02 | -.02 | .02 | .01 | -.18* | -.04 | .09 | .13 | 1.00 | | | | | | | | | | |
| 10. Age | 18.57 | 0.77 | .02 | .09 | .17* | -.10 | -.01 | .02 | .12 | .39** | .17* | 1.00 | | | | | | | | | |
| 11. Warmth | 3.34 | 0.80 | -.03 | .02 | .02 | -.10 | -.19** | -.02 | -.12 | -.01 | .05 | .08 | 1.00 | | | | | | | | |
| 12. Competence | 3.48 | 0.73 | .16* | .10 | .06 | .23** | -.02 | -.07 | -.01 | .14* | -.03 | .12 | .44** | 1.00 | | | | | | | |
| 13. PA | 2.00 | 0.63 | .00 | -.03 | .16* | -.02 | .00 | .08 | .07 | .16* | .04 | .14 | .12 | .06 | 1.00 | | | | | | |
| 14. NA | 1.70 | 0.67 | .00 | .03 | .10 | -.06 | .02 | .02 | .04 | .17* | .08 | .17* | .04 | .03 | .71** | 1.00 | | | | | |
| 15. Preparedness | 3.63 | 0.66 | .21** | .19** | .03 | .03 | .01 | -.12 | .14 | .10 | -.10 | -.01 | .32** | .40** | -.06 | -.17* | 1.00 | | | | |
| 16. Passion | 3.27 | 1.08 | .15* | .12 | .15* | .30** | -.08 | -.15* | .05 | -.03 | .02 | .02 | .30** | .55** | -.05 | -.04 | .45** | 1.00 | | | |
| 17. Femininity[a] | 0.00 | 1.00 | .10 | -.01 | -.09 | .03 | .08 | -.03 | -.14 | .01 | -.09 | -.03 | .12 | .20** | .05 | .03 | .07 | .08 | 1.00 | | |
| 18. Masculinity[a] | 0.00 | 1.00 | .14 | .06 | .02 | .05 | .02 | -.05 | -.02 | -.11 | -.14* | -.14* | .11 | .11 | -.06 | -.20** | .16* | .02 | .00 | 1.00 | |
| 19. Physical attractiveness | 2.59 | 0.34 | .13 | .04 | .08 | .10 | .03 | .07 | .13* | .00 | .00 | .08 | .02 | .32** | .12 | .00 | .03 | .11 | .06 | .03 | 1.00 |

Note: N= 195, a = *Standardized*

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

***Correlation is significant at the 0.05 level (2-tailed).*

**Table 3.2:** ANCOVA Results of Between-Subject Effects on Investment Preference

| **Panel A: Group Means and Standard Deviations** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Male** | | | | **Female** | | | |
| | **Gendered Voice** | | | | **Gendered Voice** | | | |
| | Masculine | | Feminine | | Masculine | | Feminine | |
| **Gendered Service** | **n** | **Mean** | **n** | **Mean** | **n** | **Mean** | **n** | **Mean** |
| Masculine | 27 | 0.27 | 27 | 0.14 | 27 | 0.19 | 27 | -0.21 |
| | | (0.11) | | (0.22) | | (0.11) | | (0.19) |
| Feminine | 15 | -0.18 | 28 | 0.00 | 28 | 0.01 | 16 | 0.82 |
| | | (0.18) | | (0.10) | | (0.11) | | (0.30) |

| **Panel B: Test of Hypotheses** | | | | |
|---|---|---|---|---|
| **Source** | **D.F.** | **M.S.** | **F-value** | **p-value** |
| Age | 1 | 0.230 | 0.389 | 0.534 |
| Listeners' Sex | 1 | 0.351 | 0.593 | 0.442 |
| Hearing Impediment | 1 | 0.024 | 0.04 | 0.842 |
| Familiarity | 1 | 1.44 | 2.436 | 0.120 |
| Warmth | 1 | 0.203 | 0.344 | 0.558 |
| Competence | 1 | 0.359 | 0.606 | 0.437 |
| Physical Attractiveness | 1 | 3.679 | 4.101 | 0.044** |
| PA | 1 | 0.119 | 0.202 | 0.654 |
| NA | 1 | 1.148 | 1.941 | 0.165 |
| Preparedness | 1 | 1.923 | 3.252 | 0.073* |
| Passion | 1 | 0.375 | 0.634 | 0.427 |
| Femininity | 1 | 0.656 | 1.110 | 0.294 |
| Masculinity | 1 | 1.117 | 1.889 | 0.171 |
| Sex | 1 | 2.038 | 3.447 | 0.065* |
| Gendered Voice | 1 | 4.935 | 6.493 | 0.012** |
| Gendered Service | 1 | 2.498 | 4.217 | 0.041** |
| Sex × Gendered Voice | 1 | 7.064 | 9.295 | 0.003*** |
| Sex × Gendered Service | 1 | 3.363 | 4.718 | 0.031** |
| Voice × Gendered Service | 1 | 5.002 | 8.447 | 0.004*** |
| Sex × Gendered Voice× Gendered Service | 1 | 3.538 | 5.974 | 0.015** |
| Error | 175 | 0.591 | | |

*Note:* Standard deviations are in parentheses.
[a] ****p- value <0.01,*
***p- value <0.05,*
**p- value <0.10.*

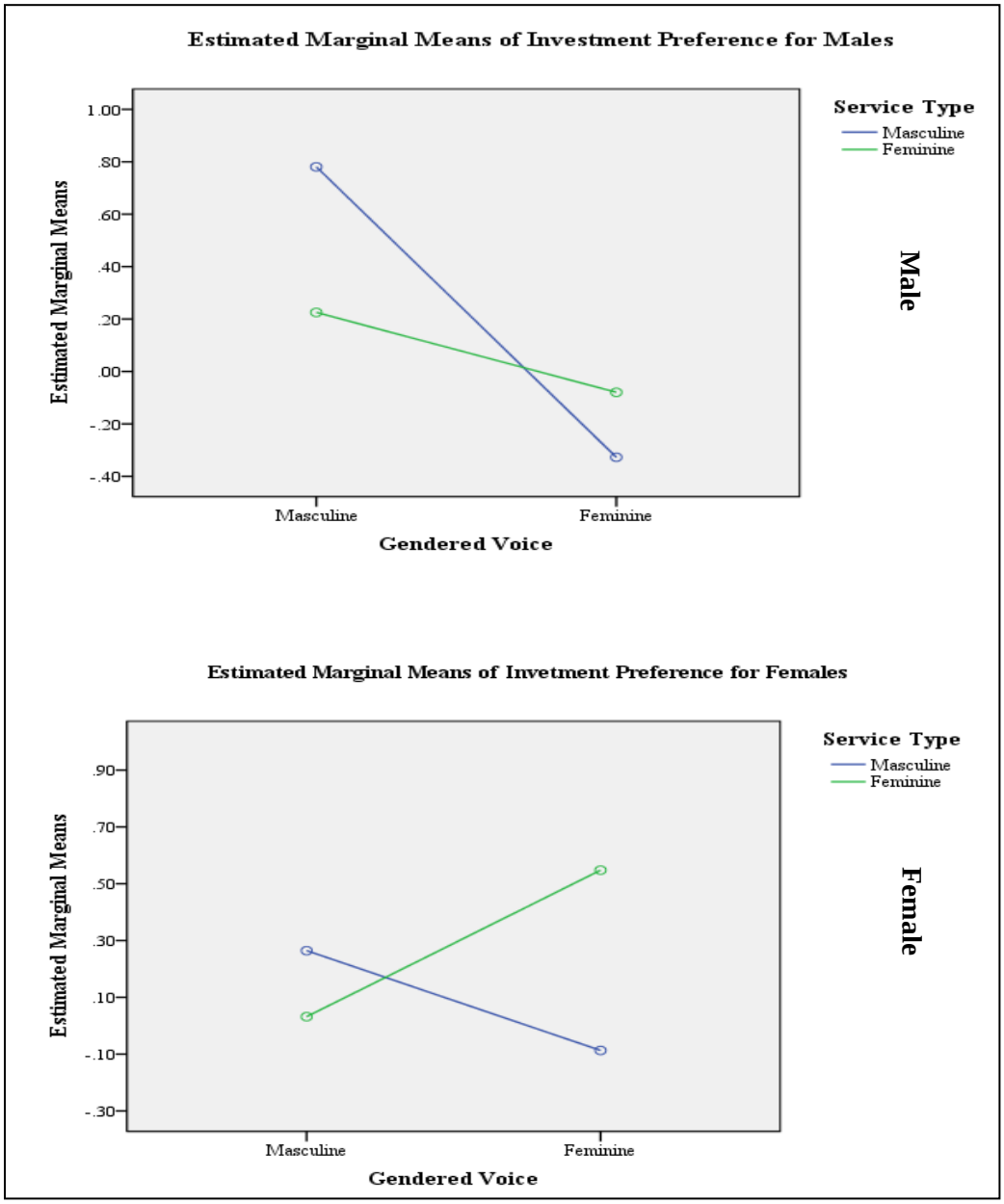


**Figure 3.2:** Effect of the Interaction of Sex, Gendered Voice, and Service on Investment Preference. Covariates are Evaluated at Means.

**Table 3.3:** ANCOVA Results of Between-Subject Effects on Willingness to Fund

**Panel A: Cell Means**

| | **Male** | | | | **Female** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Gendered Voice** | | | | **Gendered Voice** | | | |
| | Masculine | | Feminine | | Masculine | | Feminine | |
| **Gendered Service** | **n** | **Mean** | **n** | **Mean** | **n** | **Mean** | **n** | **Mean** |
| Masculine | 27 | 7.40 | 27 | 2.29 | 27 | 5.48 | 27 | 3.56 |
| | | (0.13) | | (0.33) | | (0.31) | | (0.26) |
| Feminine | 15 | 4.41 | 28 | 5.19 | 28 | 4.46 | 16 | 6.44 |
| | | (0.29) | | (0.38) | | (0.37) | | (0.22) |

**Panel B: Test of Hypotheses**

| **Source** | **D.F.** | **M.S.** | **F-value** | **p-value** |
|---|---|---|---|---|
| Age | 1 | 1.315 | 0.457 | 0.500 |
| Listeners' Sex | 1 | 0.323 | 0.112 | 0.738 |
| Hearing Impediment | 1 | 0.069 | 0.024 | 0.877 |
| Familiarity | 1 | 0.954 | 0.332 | 0.566 |
| Warmth | 1 | 0.300 | 0.104 | 0.747 |
| Competence | 1 | 0.447 | 0.155 | 0.694 |
| Physical Attractiveness | 1 | 1.238 | 0.291 | 0.590 |
| PA | 1 | 3.046 | 1.059 | 0.305 |
| NA | 1 | 7.471 | 2.597 | 0.109 |
| Preparedness | 1 | 1.530 | 0.532 | 0.467 |
| Passion | 1 | 2.690 | 0.935 | 0.335 |
| Femininity | 1 | 0.103 | 0.036 | 0.850 |
| Masculinity | 1 | 5.789 | 2.012 | 0.158 |
| Sex | 1 | 3.471 | 1.207 | 0.274 |
| Gendered Voice | 1 | 33.893 | 11.782 | 0.001*** |
| Gendered Service | 1 | 2.769 | 0.963 | 0.328 |
| Sex × Gendered Voice | 1 | 24.722 | 8.594 | 0.004*** |
| Sex × Gendered Service | 1 | 11.309 | 4.527 | 0.035** |
| Voice × Gendered Service | 1 | 195.086 | 67.816 | 0.000*** |
| Sex × Gendered Voice× Gendered Service | 1 | 12.806 | 5.125 | 0.025** |
| Error | 175 | 2.877 | | |

[a] *** *p- value <0.01,*
** *p- value <0.05,*
* *p- value <0.10.*

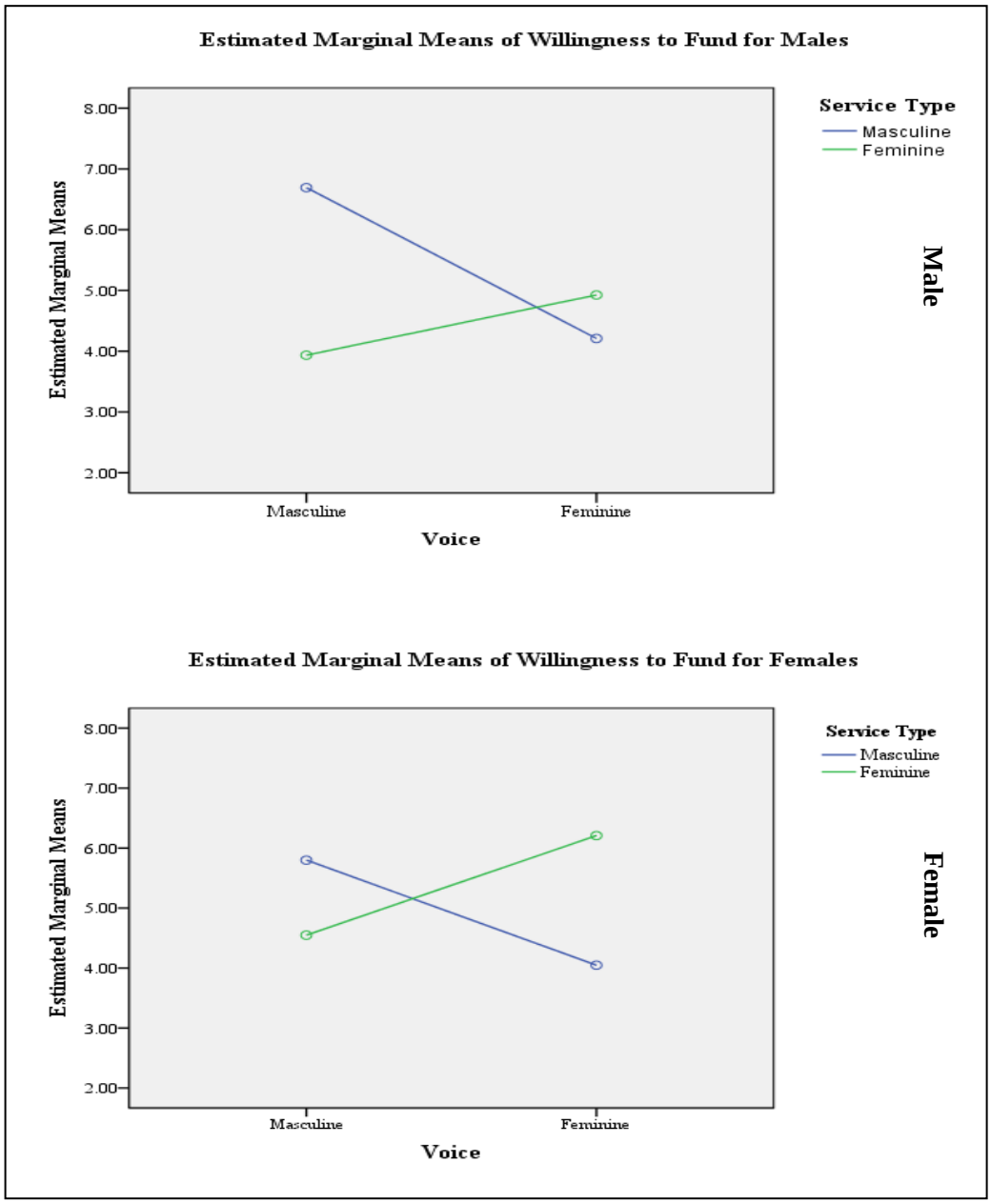


**Figure 3.3:** Effect of the Interaction of Sex, Gendered Voice, and Service on Willingness to Fund. Covariates are Evaluated at Means.

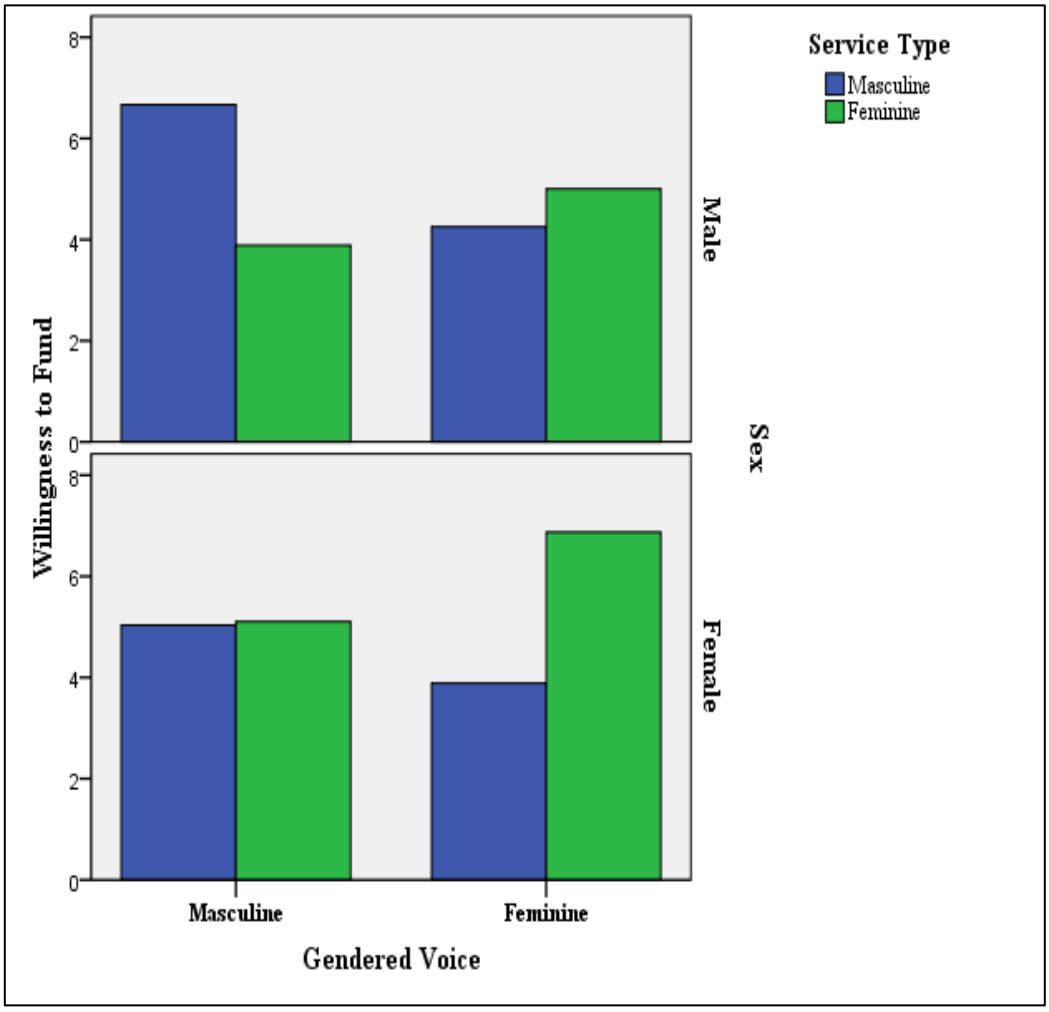


**Figure 3.4:** Willingness to Fund Predicted by Gendered Voice and Service Type for Male and Female Entrepreneurs.

# CHAPTER 4: PUTTING IMAGINATION TO WORK: ANALYZING THE LINK BETWEEN CREATIVITY AND ENTREPRENEURS' COGNITION

## 4.1 Introduction

> "The early stages of creation of new economic activities, which is arguably where entrepreneurship research can make its more distinctive contributions to the broader fields of economic and organizational studies"
>
> − Per Davidsson, (2015: 676)

Entrepreneurial scholars have long been interested in understanding how entrepreneurs turn ideas into opportunities (Kier & McMullen, 2018). At the advent of the new century, economy has shifted from knowledge-based activities to creativity, innovation, and imagination (Fillis & Rentschler, 2010; McMullen & Shepherd, 2006; Oke, Munshi, & Walumbwa, 2009; Van den Broeck, Cools, & Maenhout, 2008) and entrepreneurial scholars reoriented their focus from opportunity to venture ideas to the origins of these venture ideas (Kier & McMullen, 2018; Vogel, 2017). Ideas are the core of entrepreneurship and new venture creation (Van den Ende, Frederiksen, & Prencipe, 2015) and entrepreneurs use creative imagination to come up with new ideas and to turn these ideas into opportunities (Chiles, Tuggle, McMullen, Bierman, & Greening, 2010; Cornelissen & Clarke, 2010; Fillis & Rentschler, 2010; Suddaby, Bruton, & Si, 2015). Hence, scholars and practitioners unequivocally agree that creativity plays an important role in the entrepreneurial context (Baron & Tang, 2011; Ward, 2004). In essence, creativity is the soul of entrepreneurship (Morris & Kuratko, 2002: 104) that drives opportunity recognition (DeTienne & Chandler, 2007; Dimov, 2007), firm innovation (Sarooghi et al., 2015) and business growth (Gielnik et al., 2012). So, it is crucial to identify the factors that facilitates entrepreneurial creativity. While the majority of entrepreneurship research treats creativity as a stable personality trait, emerging research indicates that the creativity of entrepreneurs could vary significantly based on a variety of factors (Weinberger, Wach, Stephan, & Wegge, 2018). As such, it is

surprising a paucity of research examines which types of factors might increase or decrease entrepreneurial creativity (Appendix D presents a brief review of the literature examining the antecedents of entrepreneurial creativity). To address this gap, this study examines the antecedents of entrepreneurial creativity. Specifically, we examine whether entrepreneurial goal orientation (GO) and perspective-taking (PT) influence an entrepreneur's creativity.

Cognitive processes are an integral part of entrepreneurship (McMullen, 2010) and prior research has suggested that entrepreneurs use cognitive mechanisms to identify opportunities, generate creative solutions and new venture ideas (Baron, 2006; Bertels, 2018; Frederiks, Englis, Ehrenhard, & Groen, 2019; Gaglio, 2004; Prandelli, Pasquini, & Verona, 2016; Prandelli et al., 2016). As creativity is an entrepreneurial attribute (Stammerjohan, DeNardin, Winkel, & Stammerjohan, 2019; Yar Hamidi, Wennberg, & Berglund, 2008) and denotes an entrepreneur's competitive strength (Kao, 1989) and competence (Carson, Cromie, McGowan, & Hill, 1995), we focus on the learning and cognitive processes of entrepreneurs to examine entrepreneurial creativity. Despite emerging consensus that the entrepreneurial creativity is complex phenomena that cannot be understood without systematically examining the antecedent variables that influence entrepreneurial creativity, empirical investigations of the drivers of entrepreneurial creativity remain scarce (Dayan, Zacca, & Di Benedetto, 2013; Zhou, 2008). As such, our understanding of the entrepreneurial creativity is incomplete. For this reason, Dayan et al., (2013: 224) urged researchers to increase our knowledge of entrepreneurial creativity by adopting "integrative approaches" and considering the impact of mediating and moderating factors to fully comprehend the influence of antecedents on entrepreneurial creativity. In this paper, we respond to calls to more deeply examine the antecedents of entrepreneurial creativity by focusing on entrepreneurs' cognitive attributes and processes. In an effort to do so, we build on Dweck's (1986) two-factor model of goal orientation (GO) theory to propose that factors that promote individual learning tailor individual creativity. GO is a cognitive orientation that describes how individuals regulate attention and motivation with respect

to preferences related to goal achievement (Eisenberg & Spinrad, 2004; VandeWalle & Cummings, 1997). GO theory (Dweck, 1986; VandeWalle, 1997) divides GO into two-distinct orientations: learning goal orientation (LGO) and performance goal orientation (PGO). The notion that GO may influence entrepreneurial creativity lies in the fact that dispositional differences in goal orientations (Dweck, 1999; Elliot & Church, 1997; Hirst, Van Knippenberg, & Zhou, 2009) may motivate individuals to seek out, or avoid opportunities for learning. Also, using self-regulation theory, scholars have indicated and amassed considerable evidence suggesting that individual-level goal orientation has significant influence on employee creativity (Gong, Huang, & Farh, 2009; Janssen & Van Yperen, 2004). However, these studies do not explain why or how GO or differences in GO could lead to creativity. Also, employee creativity is influenced by several contextual factors and work-unit goal orientation (Lee & Yang, 2015) that are inapplicable to the setting of entrepreneurial creativity. Hence, we investigate how GO leads to entrepreneurial creativity and we also propose that cognitive influences through perspective taking (PT) mediates the relationship between GO and entrepreneurial creativity.

PT is defined as a cognitive process that involves imagining the world through others' viewpoints (Galinsky, Ku, & Wang, 2005). In this study, we argue that GO influences an individual's desire and ability to take others' perspectives and understand what others find useful (Caruso, Epley, & Bazerman, 2006; Grant & Berry, 2011; Kunda, 1990). Such perspective taking is an active process in which an observer tries to adopt others' thoughts, motives, feelings, and viewpoints to understand why they think and/or feel the way they do (Parker, Atkins, & Axtell, 2008: 151; Parker & Axtell, 2001), that in turn, affects creativity. We theorize that LGO will lead to elevated PT, which will result in higher levels of creativity. On the other hand, we theorize that PGO will hinder the ability to take others' perspectives, which will hamper creativity. Hence, we suggest PT mediates the relationship between GO and entrepreneurial creativity. In addition, we theorize that entrepreneurial experience and entrepreneurial exhaustion moderate these effects. We pick entrepreneurial experience and entrepreneurial

exhaustion as moderators of the GO→PT→ Entrepreneurial Creativity relationships as these moderators are fitting to the Conservation of Resources Theory (Hobfoll, 1989). The COR theory suggests that exhaustion causes loss of energetical resources that can result in further resource loss (De Cuyper, Mäkikangas, Kinnunen, Mauno, & Witte, 2012; Hakanen, Perhoniemi, & Toppinen-Tanner, 2008; Mäkikangas, Bakker, Aunola, & Demerouti, 2010), for example in the form of decreased PT in individuals with both LGO and PGO. Using the tenets of COR, we view entrepreneurial experience as a resource that lead to elevated PT in entrepreneurs with LGO and PGO, therefore entrepreneurial experience can strengthen the positive relation between LGO and PT and weaken the negative relationship between PGO and PT. By including these variables in a moderated mediation model (see Figure 4.1), we analyze both the mechanisms that drive entrepreneurs' creativity as well as the boundary conditions that surround it. We first investigate our hypotheses using both a pre-test sample of entrepreneurship students and business students. We then test our entire model using a survey with a sample of practicing entrepreneurs.

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Insert Figure 4.1 about here

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In doing so, we make several noteworthy contributions to the entrepreneurship and entrepreneurial creativity literature. First and foremost, we put factors associated with learning behavior in the context of creativity. While we know creativity is valuable in entrepreneurship, we know little about what factors contribute to, or diminish, it. By linking individual learning approaches to entrepreneurial creativity, this study provides evidence of importance of understanding individual differences in studying creativity. Second, we expand the empirical knowledge regarding how entrepreneurial creativity is affected by entrepreneurs' personal factors and cognitive processes by focusing on GO and PT as antecedents of entrepreneurial creativity. As Dayan et al., (2013) noted that there is a lack of comprehensive studies that identify and assess mediating and moderating factors facilitating or inhibiting creativity, we identify PT as a mediator of

the GO-creativity relationship and investigate individual-level moderators. In doing so, we respond to Dayan's et. al., (2013) call for adopting more integrative approaches, investigating antecedents, and employing mediating variables in the study of entrepreneurial creativity. Third and finally, the study contributes to the entrepreneurship literature by analyzing the impact of entrepreneurial experience and exhaustion on creativity through a moderated mediation model. Our results suggest that entrepreneurial exhaustion significantly weakens the positive relationship between LGO and PT, and thus significantly weakens the positive relationship between PT and creativity. Also, entrepreneurial exhaustion significantly strengthens the negative relationship between PGO and PT, and thus leads to lower levels of creativity. In addition, our results demonstrate that entrepreneurial experience significantly strengthens the positive relationship between PT and creativity. Our study thus opens new avenues for investigating other dynamic cognitive processes against the backdrop of entrepreneurial creativity.

In the sections that follow, we first review the GO theory and integrate with cognitive mechanisms to explain our hypotheses. Following this, we detail the three empirical studies we conducted to test our hypotheses. We present our results and discuss the implications of our findings.

## 4.2 Theory & Hypothesis

We define entrepreneurial creativity as the capability to generate novel, appropriate, and useful ideas to solve problems (Smith, Ward, & Schumacher, 1993). Entrepreneurial creativity exists before, during, and after the lifetime of a venture as entrepreneurial creativity is guided by entrepreneurial traits and environments. As creativity is an inherent characteristic of individuals and unfolds when these individuals interact within varying situations, creativity cannot be easily described (Lee, Florida, & Acs, 2004; Sternberg & Dess, 2001). Researchers have pointed out that creativity is the process in which entrepreneurs use their creative capabilities to develop both novel and useful solutions that add value over what existed before in the market (Sternberg &

Lubart, 1995; Sternberg & O'Hara, 1999). Entrepreneurs apply their creative skills to solve challenges and problems that they encounter in their pursuit of individual goals. Hence, creativity often arises during goal-directed behavior (Hirst et al., 2009). So, we draw from GO theory (Dweck, 1986; VandeWalle, 1997) to theorize that individual differences in GO can explain individual differences in creativity.

### 4.2.1 The Effect of Goal Orientation on Creativity

The concept of GO is rooted in Atkinson's (1964) classic theory of achievement motivation. Achievement motivation theory argues that GO is a motivational orientation that influences how someone approaches, interprets, and responds to achievement situations (Dweck & Leggett, 1988; Elliot & Church, 1997; Hirst et al., 2009). Individuals' self-development beliefs are reflected by GO and these beliefs guide individuals to interpret and interact with their environment. Dweck (1986) proposed two distinct goal-orientations: 1) LGO, which focuses on developing competence and task mastery through acquiring new skills, and 2) PGO, which focuses on demonstrating competence to others and avoiding negative evaluations. Scholars have further partitioned PGO into two separate orientations:1) PGO-Approach which focuses on attaining favorable judgements of competence, and 2) PGO-Avoidance, which aims at avoiding negative evaluations (VandeWalle, 1996, 1997; Elliot & Harackiewicz, 1996). While PGO-Approach and PGO-Avoidance are distinct orientations, for the purposes of this study, we believe both will have similar impacts on creative thinking because they both share a desire to avoid novelty and challenging environments which could pose a threat to demonstrations of competence. We explain our reasoning surrounding relationships between LGO, PGO, and creativity in greater detail below.

Emerging research indicates that LGO and PGO can play significant roles in entrepreneurial cognitive processes (Uy, Sun, & Foo, 2017). Individuals with LGO are expected to relate with both acquisition of skills and intrinsic motivation as they believe in efforts to develop skills and abilities (Hirst et al., 2009). A focus on LGO motivates

individuals to acquire new knowledge and develop "deep-processing strategies" to facilitate mastery of new skills and abilities (Elliot &McGregor, 2001). Individuals high in LGO hold the belief that one's ability is malleable and with efforts and learnings, new skills can be developed (Ames, 1992; Kozlowski et al., 2001). They are more focused on skill development believing that greater efforts lead to more success (Button, Mathieu, & Zajac, 1996). Also, individuals high in LGO tend to focus more on learning and self-improvement (Poortvliet, Janssen, Van Yperen, & Van de Vliert, 2007) and show an intrinsic interest in understanding and mastering task performance (Janssen & Van Yperen, 2004). Such intrinsic interest leads to deeper and more intensive engagement with tasks, which promotes creativity (Amabile, 1996). Moreover, individuals high in LGO prefer challenging and demanding tasks (VandeWalle, 1997; VandeWalle, 2003); overcoming these difficulties often requires higher levels of creative thinking. Individuals high in LGO are also more receptive to criticism and are more likely to cope with negative feedback in a constructive manner. These aspects facilitate creative thinking because LGO promotes using feedback in a way that facilitates problem-solving (Dweck, 1999; Hirst et al., 2009).

On the other hand, external outcomes associated with performances motivates the individuals with PGO. Individuals high in PGO tend to be more concerned with the outcomes of their performance rather than learning or mastering tasks (VandeWalle, 2003). PGO is often maladaptive, prompting the search for unchallenging situations, thus ensuring positive evaluations of one's performance. Individuals high in PGO prefer to avoid novel or challenging achievement situations (Kozlowski, Gully, Brown, Salas, Smith & Nason, 2001) because they may require extra effort and pose a threat to one's capabilities. Individuals high in PGO rely more on external evaluations relative to others and focus more on receiving rewards, avoiding negative criticisms and feedback. Failure to achieve reflects negatively on the self for performance goal-oriented individuals so they withdraw attention and effort (Dweck, 1986). PGO has been found to have negative effects on learning motivation and effort, (Colquitt & Simmering, 1998; Fisher & Ford, 1998), feedback seeking (VandeWalle & Cummings, 1997), meta-cognitive activities

(Ford, Smith, Weissbein, Gully, & Salas, 1998) and self-efficacy (Chen, Gully, Whiteman, & Kilcullen, 2000; Phillips & Gully, 1997). The desire to avoid mistakes and poor performance tend to suppress the desire of individuals high in PGO to attempt new or uncertain tasks. Since creativity entails high task difficulty and task failure and performance goal-oriented individuals tend to withdraw from such tasks as such tasks can draw attention to their creative deficiencies. To the extent that novelty and uncertainty carry the risk of failure, PGO tends to suppress the motivation to engage in creative endeavors. Whereas LGO should lead to higher levels of creativity among entrepreneurs because it intensifies approach motivations and intrinsic interest in the task itself (Caniëls, De Stobbeleir, & De Clippeleer, 2014), we theorize that PGO will lead to lower levels of creativity because it induces individuals to seek out situations where they can avoid looking incompetent and discourages risk-taking and venturing into environments that are new and foreign. Therefore, we expect:

**H1:** *LGO is positively related to creativity.*

**H2:** *PGO is negatively related to creativity.*

### 4.2.2 The Mediating Role of Perspective Taking

We theorize that the relationship between GO and creativity is mediated by PT. PT is a key process that explains one cognitive mechanism through which creative solutions emerge from goal-directed motivations. PT involves thinking about and trying to adopt others' thoughts, motives, feelings, and viewpoints to understand why they think and/or feel the way they do (Parker, Atkins & Axtell, 2008, p. 151, Parker & Axtell, 2001). Perspective-takers simulate what it would be like to be someone else and to understand the world from that person's viewpoint.

By engaging in PT, entrepreneurs are able to develop more creative solutions that solve their customers' problems. Whereas GO explains the motivational orientations of entrepreneurs, we argue that PT explains one of the pathways through which those motivations ultimately influence creative ideation. As a cognitive process,

PT likely serves as an antecedent mechanism that explains how creative ideas actually arise. Research shows that PT fosters creativity because individuals who simulate what it would be like to be someone else and consider more numerous and diverse perspectives gain a deeper understanding of which ideas are more beneficial to others (Amabile, 1996; Grant & Berry, 2011). We argue that PT mediates the relationship between GO and creativity. Motivated action theory (DeShon & Gillespie, 2005) provides that having LGO is associated with concrete action plans and these action plans involves proactive behaviors, which are broadly categorized into information-seeking and relationship-building actions (Gong, Cheung, Wang, & Huang, 2012; Grant & Ashford, 2008). Proactive individuals engage in information exchange and build trust relationships that fosters creativity. Hence, LGO is likely to intensify PT because individuals high in LGO are more likely to build relationships and seek information from others, that in turn help them to understand the perspectives of other people. This occurs because individuals high in LGO seek information from diverse sources, are intrinsically and pro-socially motivated (Steele-Johnson, Beauregard, Hoover, & Schmidt, 2000), and are more comfortable seeking help from others to improve their learning and task skills. Prosocial motivation enhances the effect of intrinsic motivation and drives individuals in the pursuit of meaningful outcome goal of helping others (Batson, 1998; Grant, 2007; Grant & Berry, 2011). So, individuals high in LGO have a desire to benefit others and are driven to adopt others perspective to develop ideas that are useful to different stakeholders and will leave an impact on future generations (Simonton, 1989). All of these activities promote PT (Anderson & Williams, 1996; Chiaburu, Marinova, & Lim, 2007), which is conducive to creativity. In addition, PT has influence on how information is processed and reframed by the entrepreneurs with LGO, which can impact creativity (Hoever, Van Knippenberg, Van Ginkel, & Barkema, 2010).

In contrast, PGO is likely to reduce PT, decreasing creativity. Individuals high in PGO are more self-focused and self-regulated (Kozlowski et al., 2001). So, they may find it difficult to adopt others perspective because they emphasize achievement rather

than learning and tend to avoid information or tasks that could prove threatening to their competence or raise uncertainties. Also, individuals high in PGO believe that self-attributes are fixed and hard to develop and extra effort and hard work make them appear less competent. So, individuals with PGO withdraw from difficult tasks or avoid tasks that are likely to fail as they want to maintain their competence in the eye of others (Janssen & Prins, 2007). In addition, individuals with PGO aim to validate the adequacy of their competence and tend to avoid feedback because they believe that feedback draws attentions to their competency deficiencies (VandeWalle, 2003). As such, individuals with PGO are less likely to take others' perspectives because doing so invites new and uncertain information that can challenge their competence or elevate the possibility that their current evaluation of the situation is erroneous. So, GO cognitions invoke consideration of other individuals' views and opinions involved in PT and these considerations impact creative thinking. Therefore, we contend that the effect of GO on creativity is likely to occur, in part because of PT:

**H3:** *PT partially mediates the positive relationship between LGO and creativity.*

**H4:** *PT partially mediates the negative relationship between PGO and creativity.*

### 4.2.3 The Moderating Role of Entrepreneurial Exhaustion and Experience

Creativity research indicates that domain experience (Weisberg, 2009) and burnout/exhaustion (de Jonge, Spoor, Sonnentag, Dormann, & van den Tooren, 2012) can play significant roles in the facilitation or hindrance of creative ideation. Given that entrepreneurs work in unpredictable environments for long hours to overcome the challenges associated with launching ventures (Aldrich & Martinez, 2001), we theorize that factors related to their work as well as their own perceptions of exhaustion will moderate relationships between GO, PT, and creativity. This is in line with the COR theory which argues that resources provide a sense of mastery and control (De Cuyper

et al., 2012) and individuals with more resources have the potential of further resource gain and are less vulnerable to resource loss (Hobfoll, 2001). We view entrepreneurial experience as a resource that interact with GO to influence further resource gain, i.e. elevated PT, that in turn will positively influence entrepreneurial creativity, when the resource, i.e. entrepreneurial experience is high rather than low. On the other hand, exhaustion denotes a state of resource depletion (Hobfoll & Freedy, 2017) in which individuals engage in defensive, avoidance, and withdrawal coping mechanisms to protect themselves from further resource loss (Cole & Bedeian, 2007; Halbesleben, 2006; Hobfoll, 2002; Lapointe, Vandenberghe, & Panaccio, 2011; Siegall & McDonald, 2004; Swider & Zimmerman, 2010; Wright & Cropanzano, 1998). Hence, we reasoned that entrepreneurs' level of exhaustion will interact with GO in the prediction of PT, which will ultimately influence entrepreneurial creativity. Specifically, when entrepreneurs with LGO feel a high level of emotional exhaustion, they may withdraw from spending more resources to engage in elevated PT, which can weaken the indirect effect of PT on entrepreneurial creativity. On the other hand, when entrepreneurs with PGO feel a high level of emotional exhaustion, they may completely withdraw from engaging in PT, which may lead to decreased creativity.

Entrepreneurial experience can help individuals to adopt unfamiliar ideas and make associations between distant ideas. Individuals with prior exposure to entrepreneurship have increased knowledge about the entrepreneurial process and find it easy to start new ventures (Delmar & Davidsson, 2000; Yar Hamidi et al., 2008). Hence, we theorize that entrepreneurial experience will influence entrepreneurs' ability to engage in PT because experienced entrepreneurs are more likely to understand that taking others' perspectives while solving a problem provides crucial insights during opportunity recognition (Prandelli, Pasquini, & Verona, 2016). Experienced entrepreneurs are better able to detect patterns and seek appropriate information to identify business opportunities than inexperienced entrepreneurs (Baron & Ensley, 2006), hence, high entrepreneurial experience will influence the effect of GO on PT. As LGO promotes a learning focus and individuals high in LGO seek to develop new skills

and knowledge through challenging work, we expect these entrepreneurs to use their experience to understand the value of PT in idea generation and opportunity recognition. Entrepreneurs high in LGO search for processes that help them master the art of opportunity recognition, so to the extent that experience shows them the value of PT, they are more likely to adopt that learning, and engage in more PT. Also, experienced entrepreneurs with LGO are more likely to see PT as a valuable cognitive process and will engage in PT to expand their understanding of the needs, wants, and preferences of their customers rather than trying to brainstorm these things themselves. Similarly, higher experience mitigates the negative relationship between PGO and PT because experienced entrepreneurs see that PT is valuable and engaging in PT actually helps them to avoid looking incompetent. Thus, experience marginalizes the negative relationship between PGO and PT. Based on the above-mentioned arguments, we expect the following:

> **H5:** *The indirect relationship between LGO and creativity, through PT, is moderated by entrepreneurial experience such that the relation is stronger when entrepreneurial experience is higher rather than lower.*

> **H6:** *The indirect relationship between PGO and creativity, through PT, is moderated by entrepreneurial experience such that the relation is weaker when entrepreneurial experience is higher rather than lower.*

We further theorize that entrepreneurial exhaustion moderates the indirect effect of GO on creativity, through PT. While exhaustion typically is associated with time pressure and work load, prior research has established that burnout is partly a reaction to frustrated goal striving (Naidoo et al., 2012). Entrepreneurs work in an emotionally charged and highly demanding environment that hinders their goal achievement, that, in turn, can lead to exhaustion (Halbesleben & Buckley, 2004; Maslach, Schaufeli, & Leiter, 2001). As exhaustion results from one's inability to effectively achieve one's

goals, differences in goal orientations may reduce personal efficacy and influence one's capability to seek information. Hobfoll's (1989) conservation of resources (COR) model suggests that when individuals perceive threats towards their valued resources, they feel emotionally drained and exhausted. Higher levels of entrepreneurial exhaustion increase feelings of depletion and reduce the motivation or desire to engage in cognitively challenging processes. To avoid losing resources, individuals are prompted to adjust their goal-directed actions to mitigate the threat. Even though we expect entrepreneurs high in LGO to seek new information from diverse perspectives to develop skills and task mastery, these entrepreneurs will struggle to focus on learning and seek information at higher levels of exhaustion. Exhausted entrepreneurs with LGO will not have the energy to seek more information from different sources which may interfere with the cognitive process of PT and constrains their ability to take others' perspective that, in turn, reduce their creativity. On the other hand, individuals with PGO are not resilient to challenges and unable to persist in the face of obstacles and failures. We theorize that entrepreneurs with PGO will find it more difficult to consider information from different sources at higher levels of exhaustion, because exhausted entrepreneurs with PGO will view any new information as challenges to their existing capabilities. At high levels of exhaustion, entrepreneurs with PGO will avoid any information that threaten their competence which may hamper their PT, which in turn reduces their ability to perform creatively. Accordingly, we expect:

> **H7:** *The indirect relationship between LGO and creativity, through PT, is moderated by entrepreneurial exhaustion such that the indirect effect is stronger when entrepreneurial exhaustion is low and is weaker when entrepreneurial exhaustion is high.*

> **H8:** *The indirect relationship between PGO and creativity, through PT, is moderated by entrepreneurial exhaustion such that the indirect effect is weaker when entrepreneurial exhaustion is low and is stronger when entrepreneurial exhaustion is high.*

## 4.3 Method

We investigated our theoretical model across three different studies, all of which were approved by a university institutional review board. In Study 1, we tested the relationship between GO and PT using a sample of 103 undergraduate students from a university in the Northwest region of the US who were taking an entrepreneurship course and completing an entrepreneurial project at the time of the survey. In Study 2, we tested our model using a cross-sectional survey of 88 business students from a university in the Northwest region of the US who have taken entrepreneurial courses and have completed an entrepreneurial project. Using Study 1, we tested the GO-PT relationships to examine if GO is a significant predictor of PT. In Study 2, we investigated the GO-PT-Creativity relationships and the moderating role of exhaustion. In Study 3, we conducted a two-wave, lagged survey using 173 entrepreneurs from Amazon's Mechanical Turk. Using Study 3, we test these hypotheses again to determine if PT mediates the relationship between GO and creativity and the moderating role of entrepreneurial exhaustion and experience.

## 4.4 STUDY 1

### 4.4.1 Overview of the Study

The purpose of Study 1 is to examine the relationship between GO and PT. While PT has been known to aid in team creativity by fostering a cooperative mindset to consider diversity (Hoever et al., 2010), employee creativity by strengthening the effect of intrinsic motivation on creativity (Grant & Berry, 2011), opportunity recognition (Prandelli et al., 2016), and new product innovation (McMullen, 2010), a gap exists surrounding its antecedents. Also, no prior published studies have linked goal orientations to PT (see Figure 4.2). As we proposed that PT mediates the effects of GO on creativity, it is essential to examine the effect of GO on PT before examining the full theoretical model. As such, the goal of this study is to analyze if GO play key roles in developing or diminishing entrepreneurs' abilities to take the perspective of others.

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Insert Figure 4.2 about here

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### 4.4.2 Participants and Procedures

Hundred and three undergraduate students ($M_{age}$ = 22.17, $SD_{age}$ = 1.94, female = 42%) participated in Study 1. The recruited participants were taking an entrepreneurship course and were completing an entrepreneurial project at the time of the survey. Participation in the study was voluntary and compensated through course credit. Participants completed validated scales for GO and PT. Then they were asked to provide demographics and complete other control variable scales. Participants were then thanked and debriefed.

### 4.4.3 Measures

#### *4.4.3.1 Dependent Variable*

##### *4.4.3.1.1 Perspective-Taking*

PT was measured using 4-item scale from Davis, (1983), Davis, Conklin, Smith, & Luce, (1996) and Grant & Berry (2011). One item from the scale was "I frequently try to take other people's perspectives" (1 = strongly disagree to 7 = strongly agree). The construct demonstrated strong reliability (composite reliability [CR]=0.91; Cronbach's α = 0.90).

#### *4.4.3.2 Independent Variable*

##### *4.4.3.2.1 Goal Orientation*

Because we were interested in the extent to which GO impacts PT and we used student sample in Study 1, we used VandeWalle (1997) 13-item goal orientation scale with following instructions: Please circle the number that indicates your agreement or disagreement with each of the following statements. A sample item was "I often look for opportunities to develop new skills and knowledge" (1 = strongly disagree to 7 = strongly agree). The items loaded to two different factors—*performance approach* and

*performance avoidance* goal orientations, which is consistent with the VandeWalle (1997) 13-item goal orientation scale as the scale captures the approach and avoidance dimensions of PGO. The construct demonstrated strong reliability (composite reliability [CR]=0.88; Cronbach's α = 0.87).

*4.4.3.3 Controls:*

*4.4.3.3.1 Demographic Factors*

Prior literature on PT calls for controlling demographic factors. we controlled for demographic factors by including age, gender, and personality traits. We controlled for Conscientiousness [4-item scale from (Donnellan, Oswald, Baird, & Lucas, 2006); CR=0.87, Cronbach's α =0.86] and agreeableness [4-item scale from scale from (Donnellan et al., 2006); CR=0.70, Cronbach's α =0.69].

*4.4.3.3.2 Cognitive Processes*

Since PT is a cognitive mechanism, we control for other cognitive processes that may influence the PT in the goal orientation context. we controlled for Intrinsic motivation [4-item scale from (Grant, 2008); CR=0.90, Cronbach's α =0.89], Empathic concern [4-item scale from (Davis, 1983); CR=0.88, Cronbach's α =0.86], Pro-social Motivation [5-item scale from (Grant & Sumanth, 2009); CR=0.85, Cronbach's α =0.82], and psychological ownership (7-item scale from (Van Dyne & Pierce, 2004); CR=0.80, Cronbach's α =0.79].

### 4.4.4 Analyses & Results

As all the scales showed sufficient reliability, convergent and discriminant validity, we averaged the scales. Before proceeding with the analyses, we first assessed key assumptions about the data by reviewing skewness and kurtosis to assess normality and variance inflation factors (VIFs) to assess collinearity among constructs. We found that the data was normally distributed and the VIFs ranges from 1.01 to 1.17, which were far below the conservative thresholds (i.e. <3;Petter, Straub, & Rai, 2007).We

analyzed the data using hierarchical linear regression. Means, Standard Deviations, and correlations are reported in Table 4.1.

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Insert Table 4.1 about here

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*4.4.4.1 Regression Results*

The results of the hierarchical linear regression are presented in Table 4.2.

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Insert Table 4.2 about here

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Our findings suggest that LGO is significantly (positively) associated with PT ($\beta$ = 0.931, $p$<0.001). As PGO loaded into the PGO-Approach and PGO-Avoidance factors, we examined the effects of PGO-Approach and PGO-Avoidance on PT. As hypothesized, PGO-Avoidance is significantly (negatively) associated with PT ($\beta$ = −0.617, $p$<0.001) but contrary to our expectations, PGO-Approach is significantly (positively) associated with PT ($\beta$ = 0.639, $p$<0.001). However, this is in line with previous literature as approach goal orientation is associated with positive outcomes and focuses in attaining favorable judgements about competence, whereas avoidance goal orientation is associated with negative outcome and focuses on avoiding unfavorable judgments about competence (Dickson & MacLeod, 2004; Elliot & Harackiewicz, 1996; Nien & Duda, 2008). Among the control variables, both pro-social motivation ($\beta$ = 0.346, $p$<0.001) and intrinsic motivation ($\beta$ = 0.272, $p$<0.001) significantly predict PT.

### 4.4.5 Discussion of Study 1

The results of Study 1 provide support for our hypothesized GO→PT link. We show that GO is a significant predictor of PT. While we know PT is valuable in the entrepreneurial context, we know little about what factors contribute to, or diminish,

PT. The results of Study 1 explain how cognitive attributes can impact PT. Our findings help explain why some entrepreneurs are more successful than others in taking their customers' perspectives as these entrepreneurs are high in learning and approach goal orientations and are motivated to seek mastery and favorable judgments. In Study 2, we test our hypothesized GO→PT→ Entrepreneurial Creativity link and how exhaustion can influence these relationships using a sample of business students.

## 4.5 Study 2

### 4.5.1 Overview of Study 2

Study 1 tests the relationship between GO and PT and supports our predictions that LGO is positively associated with PT whereas PGO-Avoidance is negatively associated with PT. In Study 2, we first assess the relationship between GO and creativity to investigate the differential effect of LGO and PGO on entrepreneurial creativity. We then analyze the mediating role of PT, which predict that PT mediates the GO-Creativity relationships. Finally, we examine the moderating effect of entrepreneurial exhaustion to the GO-PT-Creativity relationships.

### 4.5.2 Participants and Procedures

Eighty-eight undergraduate students ($M_{age}$ = 22.57, $SD_{age}$ = 1.57, female = 35%) participated in Study 1. The recruited participants completed at least one entrepreneurial project. Participation in the study was voluntary and compensated through course credit. Participants completed validated scales for GO, PT, and exhaustion. Then they were provided with a scenario and were asked to generate business ideas. Participants were then thanked and debriefed.

### 4.5.3 Measures

#### *4.5.3.1 Dependent Variable*

##### *4.5.3.1.1 Creativity*

Our main dependent variable is creativity and we asked participants to generate

business ideas. In order to assess the creativity of the generated idea, we adopted the consensual assessment technique (Amabile, 1996; Grant & Berry, 2011; Prandelli, Pasquini, & Verona, 2016) and thus we relied on the objective and professional evaluations of two external reviewers who were experts in evaluating business ideas. The creativity of the generated business ideas was measured using used a four-point scale with anchors for each point that was developed by (Dean, Jillian, Thomas, & Eric, 2006) in terms of novelty and usefulness. The anchors for novelty are (1) common, mundane, or boring business ideas, (2) somewhat interesting business ideas and not obvious on first sight, (3) unusual business ideas that show some imagination, and (4) rare, unusual, ingenious, imaginative, or surprising business ideas. The anchors for usefulness are (1) solve an unrelated problem or does not produce any solution to the stated problem, (2 unreasonable or unlikely to solve the problem or somehow relates to the stated problem, (3) reasonable and offer a partial solution to the stated problem, and (4) reasonable and will solve the stated problem without regard for implementability/workability. To assess interrater reliabilities, we computed intraclass coefficients (ICC=.85: Shrout & Fleiss, 1979) and verified that the two raters achieved good reliability based on the Intraclass Correlation Coefficient (ICC: Shrout & Fleiss, 1979) within conventional guidelines (Grant & Berry, 2011; LeBreton & Senter, 2008). So, we averaged the ratings to obtain unique measures for novelty and usefulness. The compact measure of creativity encompassing these two facets shows a good reliability (Cronbach's $\alpha = 0.91$).

#### *4.5.3.2 Independent Variable*

##### *4.5.3.2.1 Goal Orientation*

Because we were interested in the extent to which GO impacts creativity and we used student sample in Study 1, we used VandeWalle (1997) 13-item goal orientation scale with following instructions: Please circle the number that indicates your agreement or disagreement with each of the following statements. A sample item was "I often look for opportunities to develop new skills and knowledge" (1 = strongly disagree to 7 =

strongly agree). The items loaded to two different factors—*performance approach* and *performance avoidance* goal orientations, which is consistent with the VandeWalle (1997) 13-item goal orientation scale as the scale captures the approach and avoidance dimensions of performance goal orientations. The construct demonstrated strong reliability (composite reliability [CR]=0.90; Cronbach's $\alpha = 0.88$).

#### *4.5.3.3 Mediating and Moderating Variables*

##### *4.5.3.3.1 Perspective-Taking*

PT was measured using 4-item scale from Davis, (1983), Davis, Conklin, Smith, & Luce, (1996) and Grant & Berry (2011). One item from the scale was "I frequently try to take other people's perspectives" (1 = strongly disagree to 7 = strongly agree). The construct demonstrated strong reliability (composite reliability [CR]=0.92; Cronbach's $\alpha = 0.90$).

##### *4.5.3.3.2 Entrepreneurial Exhaustion*

Exhaustion was operationalized using 4-items from the exhaustion subscale of the Maslach Burnout Inventory-General Survey (MBI-GS; Maslach, Jackson & Leiter, 1996). One item from the sub-scale was: "I feel emotionally drained from school-work". (1 = strongly disagree to 7 = strongly agree). The construct demonstrated strong reliability (composite reliability [CR] =0.88; Cronbach's $\alpha = 0.85$).

#### *4.5.3.4 Controls*

##### *4.5.3.4.1 Demographic Factors*

Prior literature on creativity calls for controlling demographic factors. we controlled for demographic factors by including age and gender.

##### *4.5.3.4.2 Personality traits*

After reviewing prior research concerning creativity in the goal orientation context, we controlled for several important personality traits. We controlled for

Conscientiousness and Openness (4-item scale from Donnellan, Oswald, Baird, & Lucas, 2006; CR=0.87, Cronbach's α =0.86), Intrinsic motivation (4-item scale from Grant, 2008; CR=0.90, Cronbach's α =0.89), Empathic concern (4-item scale from Davis, 1983; CR=0.88, Cronbach's α =0.86), Entrepreneurial self-efficacy (4-item scale from Zhao et al., 2005; CR=0.89, Cronbach's α =0.86), and Entrepreneurial passion for inventing and founding (10-item scale from Cardon et al., 2013; CR=0.94, Cronbach's α =0.91).

### 4.5.4 Analyses & Results

As methodologists recommend, we analyzed our hypothesized research model in a two-step procedure (Gerbing & Anderson, 1988) and used co-variance based structural equation modelling (CB-SEM). We analyzed our data using MPlus 8.2. In the first step, we assessed the validity of the measures in the structural model. After confirming the validity of the research measures, we also assessed the hypothesized research model by CB-SEM. Before proceeding with the analyses, we first assessed key assumptions about the data by reviewing skewness and kurtosis to assess normality and variance inflation factors (VIFs) to assess collinearity among constructs. We found that the data was normally distributed and the VIFs ranges from 1.09 to 1.48, which were far below the conservative thresholds (i.e. <3;Petter, Straub, & Rai, 2007). Means, Standard Deviations, and correlations are reported in Table 4.3. To achieve conservative SEM results, we ran both CFA and SEM analyses with a variant of the Maximum Likelihood (ML) estimator in Mplus 8.2 that produces robust standard errors (MLR) for the ML parameter estimates.

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Insert Table 4.3 about here

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#### *4.5.4.1 Confirmatory Factor Analysis (CFA)*

Although we have used validated scales to measure the variables, the reliability and validity of the employed scales are critical for any study. Hence, we assessed

instrument validity for all the itemized scales in the structural model by considering the standardized factor loadings from a CFA analysis along with the composite reliabilities. First, we performed a CFA analysis by specifying that each individual item that is designed to measure the latent variable load onto that latent variable. The results indicated that the almost all of the factor items meet the acceptable threshold for their loadings (i.e. > 0.70), with very few items below this level. We removed these items to ensure that all the multi-item constructs are adequately measuring the variables of interests. Also, we assessed the convergent and discriminant validity of the measures in the structural model with average variance extracted (AVE) and a comparison of squared correlations with AVE, as methodologists recommend (Hair, Black, Babin, Anderson, & Tatham, 2006). As already reported all the scales were above the acceptable thresholds for reliability in terms of CR and Cronbach's α. We then assessed the convergent validity by calculating the AVE of each construct and assessed the discriminant validity by comparing the squared correlations with AVE (Hair et al., 2006). The AVEs were above the recommended value of 0.50 (Hair et al., 2006), ranging from 0.631 to 0.752. All constructs met the Fornell-Larcker criterion with a greater AVE than all squared correlations (Hair et al., 2006). We ran the CFA model and our model suggested adequate fit with $\chi^2 = 1243.88$, df = 815; CFI = .920; TLI = .90; RMSEA = .057; SRMR= .076.

### *4.5.4.2 Structural Model*

We proceed to test our hypotheses by fitting the structural model. We ran our baseline structural models with controls. Our structural model suggested adequate fit with $\chi^2 = 1373.58$, df = 920; CFI = .926; TLI = .845; RMSEA = .056; SRMR= .066. The structural model results are summarized in Table 4.4.

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Insert Table 4.4 about here

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Hypothesis 1 predicted a positive relationship between LGO and Creativity. Our

results suggest that LGO is significantly (positively) associated with creativity (β=0.584, p<0.001). As predicted in hypothesis 2, PGO-Avoidance is significantly (negatively) associated with creativity (β= -0.285, p<0.001). Also, PGO-Approach is significantly (negatively) associated with creativity (β= -0.274, p<0.001). We also found that PT is significantly (positively) associated with creativity (=0.298, p<0.001). To test the mediating effect of PT, we used the procedure developed by Edwards and Lambert (2007, Model A). We calculated the indirect effect of LGO on creativity mediated through PT by computing the indirect effect and developed bias-corrected confidence interval (BCI) with 2,000 bootstrap resamples, through Mplus 8.2. The coefficient for the indirect effect of LGO on creativity was .20 (SE = .05), and the 95% bias-corrected confidence interval (BCI) did not include zero [.11, .31], indicating a significant result and providing support for Hypothesis 3. Similarly, we calculated the indirect effect of PGO-Approach on creativity mediated through PT by computing the indirect effect and developed bias-corrected confidence interval (BCI) with 2,000 bootstrap resamples, through Mplus 8.2. The coefficient for the indirect effect was .11 (SE = .03), and the 95% BCI did not include zero [.06, .18], indicating a significant result and providing support for Hypothesis 4. Also, we calculated the indirect effect of PGO-Avoidance on creativity mediated through PT by computing the indirect effect and developed bias-corrected confidence interval (BCI) with 2,000 bootstrap resamples, through Mplus 8.2. The coefficient for the indirect effect was -.12 (SE = .02), and the 95% BCI did not include zero [-.15, -.08], indicating a significant result and providing support for Hypothesis 4. To further determine if PT mediates the relationship between GO and creativity, we calculated and compared the direct, indirect, and total effects using the (Hayes, 2017). The mediations results presented in Table 4.5 also supports that the relationship between LGO and PGO is indeed mediated partly by PT.

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Insert Table 4.5 about here

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We tested for the moderating role of entrepreneurial exhaustion (hypotheses 7

and 8) using the latent moderated structural equation (LMS) procedure developed by Sardeshmukh and Vandenberg (2017) using Mplus 8.2. LMS allows for testing of moderation and moderated mediation through structural equation modeling. It relies upon raw data and numerical integration; the procedure is recommended for calculating robust estimates that are consistent and unbiased (Sardeshmukh & Vandenberg, 2017). The LMS procedure does not calculate fit statistics associated with traditional structural equation modeling (e.g., CFI, TLI) when interactions terms are included. Instead, the fit of a baseline model excluding interaction terms (but including direct effects of moderators) is compared with the fit of the model including interaction terms using the Akaike Information Criterion (AIC), with smaller AIC values indicating better model fit (Sardeshmukh & Vandenberg, 2017).

To assess the baseline structural model, paths are added between the independent, mediator and criterion variables but moderator variables are added as direct effects. The fit of the baseline model without interaction terms was acceptable ($\chi^2 = 1686.911$, df = 1094; RMSEA = .08, CFI = .774, TLI = .747, SRMR = .07, AIC = 2048.911). When the interaction terms were added (through the XWITH command in Mplus) to the baseline structural model, the AIC decreased to 2015.914 ($\Delta$AIC = -32.997), indicating that adding the interaction terms resulted in a better fitting model.

Hypothesis 7 predicted that the indirect effect of LGO on creativity through PT is moderated by entrepreneurial exhaustion such that high entrepreneurial exhaustion weakens the positive relationship between LGO and creativity. Hypothesis 8 predicted that the indirect effect of PGO on creativity through PT is moderated by entrepreneurial exhaustion such that high entrepreneurial exhaustion strengthens the negative relationship between PGO and creativity. The statistical results of the model with interaction terms are reported in Table 4.6.

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Insert Table 4.6 about here

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As shown in the results predicting PT, the interactions of LGO with

entrepreneurial exhaustion (β = -0.08, SE = .04, p < .05, 95% CI [-.15, -.01]). Also, the interactions of PGO-Approach with entrepreneurial exhaustion is marginally significant (β = -.04, SE = .02, p < .10, 95% CI [-.08, .00]) whereas the interactions of PGO-Avoidance with entrepreneurial exhaustion is significant (β = -.12, SE = .03, p < .001, 95% CI [-.18, -.06]). These interactive effects are plotted in Figure 4.3.

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Insert Figure 4.3 about here

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Using the procedures of Edwards and Lambert (2007), recently operationalized in Mplus (through the MODEL CONSTRAINT command) by Sardeshmukh and Vandenberg (2017), we calculated the effects of entrepreneurial exhaustion for its low (mean -1SD) and high values (mean + 1SD) when the independent variable (i.e.,GO) was low (=1) and high (=7). These interactive effects for low and high levels of the moderator are plotted in Figure 4.3 and reported in Table 4.7 (see "direct effects" column).

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Insert Table 4.7 about here

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As shown here, entrepreneurial exhaustion interacted with LGO resulted in decreased PT when exhaustion was high (β = .34, SE = .10, p < .001, 95% [.14, .54]) and increased PT when exhaustion was low (β = .63, SE = .13, p < .001, 95% CI [.37, .89]). In addition, entrepreneurial exhaustion interacted with PGO-Avoidance resulted in decreased PT when exhaustion was high (β = -.81, SE = .18, p < .01, 95% CI [-1.18, -.44]) and increased PT when exhaustion was low (β = .04, SE = .13, p < .01, 95% CI [-.63, -.11]). The interactive effects for low and high levels of entrepreneurial exhaustion are reported in Table 4.7 (see the "indirect effects" column). In support of Hypothesis 7, LGO, as mediated through PT, resulted in lower levels of creativity when exhaustion was high (β = .11, SE = .05, p < .01, 95% CI [.04, .25]), and higher levels of creativity when exhaustion was low (β = .20, SE = .05, p < .001, 95% CI [.10, .31]). Also, in

support of hypothesis 8, PGO-Avoidance, as mediated through PT, resulted in lower levels of creativity when exhaustion was high (β = -.24, SE = .07, p <.01, 95% CI [-.32, -.03]), and the effects on creativity is less negative when exhaustion was low (β = -.14, SE = .04, p < .05, 95% CI [-.19, -18.]). These patterns are consistent with our predictions.

#### *4.5.4.3 Post-Hoc Analyses*

We conducted post-hoc analyses and performed a formal test to detect any common method bias (CMV). We followed the procedures for the CFA marker-variable technique (Richardson, Simmering, & Sturman, 2009). Unlike other techniques (e.g., unmeasured latent method construct [ULMC] technique), the CFA marker-variable technique specifies the comparison of free and constrained models in a way that allows for appropriate model identification (Liang, Saraf, Hu, & Xue, 2007; Williams, Hartman, & Cavazotte, 2010). Also, despite being the most frequently used technique, the ULMC has been found to have serious shortcomings in both detecting and correcting CMV (Chin, Thatcher, & Wright, 2012). Conversely, the CFA marker-variable technique, has been found to detect CMV accurately and consistently (Richardson et al., 2009). With the goal of assessing CMV, we included a marker variable "Fashion Sense" in our survey (i.e., a construct with no theoretical basis for correlation with our substantive constructs). The CFA marker-variable technique uses multiple CFA analyses to test for (1) CMV, (2) unequal (congeneric) method variance, and (3) bias due to CMV. We follow the procedure of Burns, Posey, Roberts, & Lowry, (2017) and fitted free and constrained models and tested the fit of the CFAs models for significant differences. The results of our CFA marker-variable tests indicated no biases in our sample from CMV.

### 4.5.5 Discussion of Study 2

The results of Study 2 provide support for our hypothesized research model. We show that PT mediates the GO-Creativity relationships. We also show that this indirect

effect is particularly strong when entrepreneurial exhaustion is low. These findings suggest how exhaustion can be a reaction to frustrated goal striving and impact entrepreneurial cognitive mechanisms. In addition, these findings provide evidence on the impact of cognitive processes on entrepreneurial creativity. In Study 3, we examined our full conceptual model using a sample of actual entrepreneurs.

## 4.6 Study 3

### 4.6.1 Overview of Study 3

In Study 3, we examined the full moderated mediation model involving LGO, PGO, PT, creativity, exhaustion and entrepreneurial experience using a sample of actual entrepreneurs.

### 4.6.2 Participants and Procedures

Data from One hundred and seventy-three entrepreneurs from Amazon's Mechanical Turk ($M_{age}$ = 36.9, $SD_{age}$ = 9.32, female = 44%) was utilized in Study 2. First, entrepreneurs were recruited via a pre-screened occupation panel provided by TurkPrime (Litman, Robinson & Abberbock, 2017). Participants completed screening questions in our study to verify their status as an entrepreneur; only respondents who indicated that they have founded and/or currently own a company and who spend at least 40 hours per week on activities related to entrepreneurial activities were permitted to participate. Participants also indicated that they had 6.3 years of entrepreneurial experience on average with a mean firm age of 6.2 years. Most of the entrepreneurs (59%) possessed a bachelor's degree or higher with 3% holding graduate degrees. The recruited participants completed at least one entrepreneurial project. Participants were paid $9.00 for completing the survey. Participants completed validated scales for GO, PT, and self-assessed creativity. 221 entrepreneurs completed the survey from which 173 entrepreneurs had complete and usable surveys, indicating a 78% retention rate.

Then they were provided with a scenario and were asked to generate business ideas. Participants were then thanked and debriefed.

### 4.6.3 Measures

#### *4.6.3.1 Dependent Variable*

##### *4.6.3.1.1 Creativity*

Our main dependent variable is creativity and we measured creativity using ten items taken from Zhou and George (2001). One item from the scale was: "I am a good source of creative ideas" (1 = strongly disagree to 7 = strongly agree). The construct demonstrated strong reliability (composite reliability [CR]=0.93; Cronbach's $\alpha = 0.92$).

#### *4.6.3.2 Independent Variable*

##### *4.6.3.2.1 Goal Orientation*

Similar to Study 2, we used VandeWalle (1997) 13-item goal orientation scale with following instructions: Please circle the number that indicates your agreement or disagreement with each of the following statements. A sample item was "I often look for opportunities to develop new skills and knowledge" (1 = strongly disagree to 7 = strongly agree). The construct demonstrated strong reliability (composite reliability [CR]=0.93; Cronbach's $\alpha = 0.92$).

#### *4.6.3.3 Mediating and Moderating Variables*

##### *4.6.3.3.1 Perspective-Taking*

PT was measured using 4-item scale from Davis, (1983), Davis, Conklin, Smith, & Luce, (1996) and Grant & Berry (2011). One item from the scale was "I frequently try to take other people's perspectives" (1 = strongly disagree to 7 = strongly agree). The construct demonstrated strong reliability (composite reliability [CR]=0.92; Cronbach's $\alpha = 0.90$).

#### *4.6.3.3.2 Entrepreneurial Exhaustion*

Exhaustion was measured using 4-items adapted from the exhaustion subscale of the Maslach Burnout Inventory-General Survey (MBI-GS; Maslach, Jackson & Leiter, 1996). We changed the phrasing of the questions that referenced "school-work" in Study 1 to reference "work as an entrepreneur" in Study 2. One item from the sub-scale was: "I feel emotionally drained from my work as an entrepreneur" (1 = strongly disagree to 7 = strongly agree). The construct demonstrated strong reliability (composite reliability [CR]=0.82; Cronbach's $\alpha = 0.80$).

#### *4.6.3.3.3 Entrepreneurial Experience*

We asked participants for the number of years of experience they had as an entrepreneur to measure entrepreneurial experiences.

### *4.6.3.4 Controls*

#### *4.6.3.4.1 Demographic Factors*

Prior literature on creativity calls for controlling demographic factors. we controlled for demographic factors by including age, gender, and education. We also controlled for number of hours worked.

#### *4.6.3.4.2 Personality traits*

After reviewing prior research concerning creativity in the goal orientation context, we controlled for several important personality traits. We controlled for Conscientiousness and Openness (4-item scale from Donnellan, Oswald, Baird, & Lucas, 2006; CR=0.90, Cronbach's $\alpha$ =0.88), Entrepreneurial self-efficacy (4-item scale from Zhao et al., 2005; CR=0.92, Cronbach's $\alpha$ =0.90), and Entrepreneurial passion for inventing and founding (10-item scale from Cardon et al., 2013; CR=0.94, Cronbach's $\alpha$ =0.92).

## 4.6.4 Analyses & Results

Similar to Study 2, we analyzed our hypothesized research model using MPlus

8.2 in a two-step procedure (Gerbing & Anderson, 1988) and used co-variance based structural equation modelling (CB-SEM). In the first step, we assessed the validity of the measures in the structural model. After confirming the validity of the research model, we also assessed the hypothesized research model by CB-SEM.

Before proceeding with the analyses, we first assessed key assumptions about the data by reviewing skewness and kurtosis to assess normality and variance inflation factors (VIFs) to assess collinearity among constructs. We found that the data was normally distributed and the VIFs ranges from 1.03 to 1.44 which were far below the conservative thresholds (i.e. <3; Petter, Straub, & Rai, 2007). Means, Standard Deviations, and correlations are reported in Table 4.8. To achieve conservative SEM results, we ran both CFA and SEM analyses with a variant of the Maximum Likelihood (ML) estimator in Mplus 8.2 that produces robust standard errors (MLR) for the ML parameter estimates.

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Insert Table 4.8 about here

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### *4.6.4.1 Confirmatory Factor Analysis (CFA)*

Although we have used validated scales to measure the variables, the reliability and validity of the employed scales are critical for any study. Hence, we again assessed instrument validity for all the itemized scales of Study 2 in the structural model by considering the standardized factor loadings from a CFA analysis along with the composite reliabilities. First, we performed a CFA analysis by specifying that each individual item that is designed to measure the latent variable load onto that latent variable. The results indicated that the almost all of the factor items meet the acceptable threshold for their loadings (i.e. > 0.70), with very few items below this level. We removed these items to ensure that all the multi-item constructs are adequately measuring the variables of interests. Also, we assessed the convergent and discriminant validity of the measures in the structural model with average variance extracted (AVE)

and a comparison of squared correlations with AVE, as methodologists recommend (Hair, Black, Babin, Anderson, & Tatham, 2006). As already reported all the scales were above the acceptable thresholds for reliability in terms of CR and Cronbach's α. We then assessed the convergent validity by calculating the AVE of each construct and assessed the discriminant validity by comparing the squared correlations with AVE (Hair et al., 2006). The AVEs were above the recommended value of 0.50 (Hair et al., 2006), ranging from 0.530 to 0.655. All constructs met the Fornell-Larcker criterion with a greater AVE than all squared correlations (Hair et al., 2006). We ran the CFA model and our CFA model demonstrated adequate fit: with $\chi^2 = 1278.32$, df = 824; CFI = .904; TLI = .900; RMSEA = .055, SRMR = .056.

### *4.6.4.2 Structural Model*

We ran our structural model after controlling for age, gender, education, entrepreneurial self-efficacy, passion, conscientiousness and openness. Our structural model exhibits adequate fit with the data with $\chi^2 = 1338.691$, df = 869; CFI = .941; TLI = .921, RMSEA = .055, SRMR=.070. The structural model results are summarized in Table 4.9.

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Insert Table 4.9 about here

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Hypothesis 1 predicted a positive relationship between LGO and Creativity. In support of hypothesis 1, our results show that LGO is significantly (positively) associated with creativity (β=0.843, p<0.001). In hypothesis 2, we predicted a negative relationship between PGO and Creativity. Also, with the MTurk sample, the factor loadings of PGO loaded on to PGO-Approach and PGO-Avoidance dimensions. As predicted, PGO-Avoidance is significantly (negatively) associated with creativity (β = −0.463, p<0.001) and PGO-Approach is significantly (negatively) associated with creativity (β= −0.190, p<0.001). Our analyses also suggest that LGO is significantly (positively) associated with PT (β= 0.642, p<0.001), PGO-Approach is significantly

(positively) associated with PT (β= 0.163, p<0.05), and PGO-Avoidance is significantly (negatively) associated with PT (β= −0.219, p<0.05). In addition, PT is significantly (positively) associated with creativity (β=0.381, p<0.001).

To test the mediating effect of PT, we used the procedure developed by Edwards & Lambert, (2007, Model A). So, we calculated the indirect effect of LGO on creativity mediated through PT by estimating the indirect effects and developed bias-corrected confidence interval (BCI) with 2,000 bootstrap resamples, through Mplus 8.2. The coefficient for the indirect effect was .24 (SE = .02), and the 95% BCI did not include zero [.21, .29], indicating a significant result and providing support for Hypothesis 3. Similarly, we calculated the indirect effect of PGO-Approach and PGO-Avoidance on creativity mediated through PT following the similar process with 2,000 bootstrap resamples, through Mplus 8.2. The coefficient for the indirect effect for PGO-Approach and PGO-Avoidance were .06 (SE = .03) and -.08 (SE = .04). The 95% BCI for PGO-Approach [.01, .12] and PGO-Avoidance [-.17, -.01] did not include zero, indicating a significant result and providing support for Hypothesis 4. To further determine if PT mediates the relationship between GO and creativity, we conducted the mediation analysis following Hayes (2017). The direct, indirect, and total effects presented in Table 4.10 provide further evidence of the hypothesized mediation effects.

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Insert Table 4.10 about here

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Similar to Study 2, we tested for the moderating role of entrepreneurial experience (hypotheses 5 and 6) using the latent moderated structural equation (LMS) procedure developed by Sardeshmukh & Vandenberg (2017) using Mplus 8.2. To assess the baseline structural model, paths are added between the independent, mediator and criterion variables but moderator variables are added as direct effects. The fit of the baseline model without interaction terms was acceptable ($\chi^2 = 1549.845$, df = 1038; RMSEA = .054, CFI = .902, TLI = .883, SRMR = .07, AIC = 2021.845). When the interaction terms were added (through the XWITH command in Mplus) to the baseline

structural model, the AIC decreased to 2001.665 (ΔAIC = -20.18), indicating that adding the interaction terms resulted in a better fitting model.

Hypothesis 5 predicted that the indirect effect of LGO on creativity through PT is moderated by entrepreneurial experience such that high entrepreneurial experience strengthens the positive relationship between LGO and creativity. Hypothesis 6 predicted that the indirect effect of PGO on creativity through PT is moderated by entrepreneurial experience such that high entrepreneurial experience weakens the negative relationship between PGO and creativity. The statistical results of the model with interaction terms are reported in Table 4.11.

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Insert Table 4.11 about here

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As shown in the results predicting PT, the interactions of LGO with entrepreneurial experience (β = .08, SE = .02, p < .0001, 95% CI [.05 .11]) and PGO-Approach (β = .10, SE = .02, p < .0001, 95% CI [.06, .14]) and PGO-Avoidance (β = .04, SE = .02, p < .05, 95% CI [.00, .07]) with entrepreneurial experience were significant. These interactive effects are plotted in Figure 4.4.

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Insert Figure 4.4 about here

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Using the procedures of Edwards and Lambert (2007), recently operationalized in Mplus (through the MODEL CONSTRAINT command) by Sardeshmukh and Vandenberg (2017), we calculated the effects of entrepreneurial experience for its low (mean -1SD) and high values (mean +1SD) when the independent variable (i.e., GO) was low (=1) and high (=7). The interactive effects for low and high levels of entrepreneurial experience are reported in Table 4.12 (see “direct effects” column).

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Insert Table 4.12 about here

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As shown here, entrepreneurial experience interacted with LGO resulted in increased PT when experience was high (β = .54, SE = .07, p < .001, 95% CI [.39, .68]) and decreased PT when experience was low (β = .29, SE = .13, p < .001, 95% CI [.11, .47]). In addition, entrepreneurial experience interacted with PGO-Approach resulted in increased PT when experience was high (β = .65, SE = .12, p < .001, 95% CI [.40, .89]) and decreased PT when experience was low (β = .45, SE = .11, p < .001, 95% CI [.24, .65]). Moreover, entrepreneurial experience interacted with PGO-Avoidance resulted decreased PT when experience was low (β = -.22, SE = .07, p < .01, 95% CI [-.36, -.09]) but the effect is less negative when experience was high (β = -.12, SE = .05, p < .05, 95% CI [-.23, -.02]).

The interactive effects for low and high levels of entrepreneurial experience are reported in Table 4.12 (see the "indirect effects" column). In support of Hypothesis 5, LGO, as mediated through PT, resulted in higher levels of creativity (β = .06, SE = .03, p < .05, 95% CI [.01, .12]) when experience was high, and lower levels of creativity (β = .03, SE = .02, p < .05, 95% CI [.01, .09]) when experience was low. Also, in support of hypothesis 6, PGO-Approach, as mediated through PT, resulted in higher levels of creativity (β = .10, SE = .03, p < .001, 95% CI [.03, .19]) when experience was high, and lower levels of creativity (β = .07, SE = .04, p < .001, 95% CI [.02, .14]) when experience was low. Also, in support of hypothesis 6, PGO-Avoidance, as mediated through PT, resulted in lower levels of creativity when experience was low (β = -.06, SE = .03, p < .05, 95% CI [-.13, -.01]) but the effects are less negative (β = -.03, SE = .02, p < .05, 95% CI [-.08, -.003]) when experience was high. These patterns are consistent with our predictions.

Finally, we tested for the moderating role of entrepreneurial exhaustion (hypotheses 7 and 8). Hypothesis 7 predicted that the indirect effect of LGO on creativity through PT is moderated by entrepreneurial exhaustion such that high entrepreneurial exhaustion weakens the positive relationship between LGO and creativity. Hypothesis 8 predicted that the indirect effect of PGO on creativity through PT is moderated by entrepreneurial exhaustion such that high entrepreneurial

exhaustion strengthens the negative relationship between PGO and creativity. The statistical results of the model with interaction terms are reported in Table 4.11. As shown in the results predicting PT, the interactions of entrepreneurial exhaustion with LGO (β = -.14, SE = .06, p < .05, 95% CI [-.26, -.01]), with PGO-Approach (β = -.11, SE = .04, p < .05, 95% CI [-.20, -.03]), and with PGO-Avoidance (β = -.12, SE = .04, p < .01, 95% CI [-.20, -.03]) were significant. These interactive effects are plotted in Figure 4.5.

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Insert Figure 4.5 about here

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Using the procedures of Edwards and Lambert (2007), recently operationalized in Mplus (through the MODEL CONSTRAINT command) by Sardeshmukh and Vandenberg (2017), we calculated the effects of entrepreneurial exhaustion for its low (mean -1SD) and high values (mean +1SD) when the independent variable (i.e.,GO) was low (=1) and high (=7). The interactive effects for low and high levels of each moderator are reported in Table 4.12 (see "direct effects" column). As shown here, entrepreneurial exhaustion interacted with LGO resulted in decreased PT when exhaustion was high (β = .31, SE = .09, p < .01, 95% CI [.11, .50]) and increased PT when exhaustion was low (β = .51, SE = .14, p < .001, 95% CI [.23, .79]). In addition, entrepreneurial exhaustion interacted with PGO-Approach resulted in decreased PT when exhaustion was high (β = .23, SE = .10, p < .05, 95% CI [.03, .43]) and increased PT when exhaustion was low (β = .57, SE = .11, p < .001, 95% CI [.36, .78]). Also, entrepreneurial exhaustion interacted with PGO-Avoidance resulted in decreased PT when exhaustion was high (β = -.46, SE = .08, p < .001, 95% CI [-.62, -.30]) but the effects are less negative when exhaustion was low (β = -.23, SE = .09, p < .05, 95% CI [-.40, -.05]).

The interactive effects for low and high levels of entrepreneurial exhaustion are reported in Table 4.12 (see the "indirect effects" column). In support of Hypothesis 7, LGO, as mediated through PT, resulted in lower levels of creativity (β = .15, SE = .05,

$p < .05$, 95% CI [.04, .25]) when exhaustion was high, and higher levels of creativity ($\beta = .25$, SE = .08, $p < .05$, 95% CI [.07, .41]) when exhaustion was low. Also, in support of hypothesis 8, PGO-Approach, as mediated through PT, resulted in lower levels of creativity ($\beta = .06$, SE = .03, $p < .05$, 95% CI [.01, .12]) when exhaustion was high, and higher levels of creativity ($\beta = .13$, SE = .04, $p < .05$, 95% CI [.05, .22]) when exhaustion was low. Similarly, PGO-Avoidance, as mediated through PT, resulted in lower levels of creativity ($\beta = -.13$, SE = .05, $p < .01$, 95% CI [-.23, -.04]) when exhaustion was high, and higher levels of creativity ($\beta = -.06$, SE = .03, $p < .01$, 95% CI [-.14, -.01]) when exhaustion was low. Hence, we found support for our hypothesized model.

### 4.6.5 Discussion of Study 3

In Study 2, we tested the hypotheses concerning the moderating role of entrepreneurial experience in the GO-PT-Creativity relationship using a sample of entrepreneurs. We also confirmed our previous findings regarding the mediating role of PT and moderating role of entrepreneurial exhaustion in the GO-Creativity relationships. It is fascinating to note that, our findings confirmed VandeWalle's (1997) three-factor goal orientation construct as the sampled entrepreneurs either had a PGO-Approach or PGO-Avoidance GO. The findings of Study 2 are not only consistent with our hypotheses, but also replicated those found in Study 1, providing support for our hypothesized research model.

## 4.7 Discussion

While creativity research has been informed by disciplines such as psychometrics, cognitive psychology, historiometrics, biology and contextual studies (Petrowski, 2000), little is known about the mediating and moderating factors affecting entrepreneurial creativity. It is known that personal characteristics and traits are associated with creativity. For example, Whiting, (1973)argued that relatively more creative individuals tend to have independence, drive to achieve, curiosity, self-

confidence, and deep task immersion while relatively more entrepreneurial individuals tend to have self-confidence, perseverance, high energy levels, calculative risk-taking attitude, and the need to achieve. He concluded that there may be differences between being creative and being entrepreneurial but there are several overlaps. Also, creative entrepreneurial factors and competencies are stable over time, therefore these factors need to be incorporated in the model of entrepreneurial creativity to better understand entrepreneurial opportunity identification and decision-making (Barron & Harrington, 1981; Fillis, 2007; Fillis & Rentschler, 2010). In addition to personality and cognitive traits, several contextual factors can impact entrepreneurial creativity. For example, Dayan et al., (2013) proposed that several contextual factors such as external factors—resource access, resource possession, and alertness to opportunity—and individual factors such as creative self-efficacy, expertise, and intrinsic motivation are related with entrepreneurial creativity. So, it is essential to investigate how entrepreneurial creativity is influenced by contextual factors and dispositional traits to better understand the drivers of entrepreneurial creativity.

We proposed entrepreneurial goal orientations (GO) and perspective-taking (PT) as antecedents to entrepreneurial creativity. GO is a cognitive orientation and dispositional differences in GO may motivate individuals to seek out or avoid opportunities for learning and creativity. We also linked GO to another cognitive process, PT, that involves imagining the world through others' viewpoints and proposed that the effect of GO on entrepreneurial creativity is partially mediated by entrepreneurs' ability to engage in PT. As entrepreneurs work in a dynamic and challenging environment, experience and exhaustion are important individual-level constructs for them. Prior research has found that experienced entrepreneurs are better able to depict market treads, identify patters, develop useful solutions to problems, and assess and exploit market opportunities (Rerup, 2005). In addition, entrepreneurial exhaustion often results when entrepreneurs fail to achieve their goals and hinder their ability (Murnieks et al., 2020; Shepherd, Marchisio, Morrish, Deacon, & Miles, 2010). Hence, we investigated how the impact of GO on creativity through PT differs at high and low

levels of entrepreneurial exhaustion and experience.

Across the three studies in this paper, we sought to understand entrepreneurial creativity and investigate how cognitive mechanisms and traits impact entrepreneurial creativity. We discovered that GO is a significant predictor of PT and both GO and PT are conducive to creativity. Interestingly, we found that PT mediates the relationship between GO and creativity. We also found that exhaustion and experience inhibit and facilitate the impact of GO and PT on creativity, respectively. Our findings indicate that high entrepreneurial exhaustion weakens the positive effect of GO and PT on creativity, whereas, high entrepreneurial experience strengthens the positive effect of GO and PT on creativity. This is an important finding that suggests that individual-level contextual factors can hinder or facilitate entrepreneurial creativity.

### 4.7.1 Implications of the Research

Prior work on creativity has investigated the consequences of entrepreneurial creativity but less is known about the boundary conditions surrounding entrepreneurial creativity. Building on the GO theory, we argue that individual differences in goal orientations can lead to differences in individual levels of creativity. We also propose that cognitive mechanisms and personal dispositional traits influence entrepreneurial creativity. Our results from both the studies confirmed that GO influences creativity and the effect is partially mediated by PT. We also show that the indirect effect of GO on creativity through PT is contingent upon individual-level moderators.

### 4.7.2 Limitations and Future Research

Our work is not without limitations. In both the studies, we measured PT using an itemized scale instead of experimentally manipulating PT. While we have evidence from Study 2 that participants who generated creative ideas took perspective of the users, we did not explicitly prompt participants to take users' perspective. Also, we used self-reported measures of entrepreneurial exhaustion. While we accounted for social desirability bias, it is possible that our results suffer from such biases. Hence, we view our findings as demonstrative, rather than definitive, and stress on the importance of

investigating the process of entrepreneurial creativity in detail. Future research can also investigate how future-oriented cognitive processes (Frederiks et al., 2019) impact entrepreneurial creativity. Also, Lee et al. (2004) posited that entrepreneurial activity not only requires both a supportive and productive business climate but also needs an environment where creativity and innovation can flourish. A successful integration of creativity and technology can then allow an entrepreneur to commercialize the idea, product, or service. We believe future research on entrepreneurial creativity can benefit from focusing on the combined effects of personal, cognitive, and environmental factors on entrepreneurial creativity.

## 4.8 Conclusion

Our studies provide a nuanced and novel perspective into how individual differences in dispositional traits and cognitive mechanisms influence entrepreneurial creativity. We also investigate what individual-level factors enhance or inhibit entrepreneurial creativity. We show that high entrepreneurial experience and low exhaustion can foster creative ideation. We also suggest the taking the perspectives of users allow entrepreneurs to come up with creative solutions. Our findings help explain why some entrepreneurs are more successful than others in taking their customers' perspectives and coming up with creative solutions. The insights from this study advance the literature on entrepreneurial cognition (e.g., Gregoire, Corbett, McMullen, 2011) by illuminating the mechanisms and boundaries of creative processes. We believe this study sparks new discussion concerning entrepreneurial creativity and opens new insights into how the cognitive and personal traits of entrepreneurs can be influence his/her creativity in a positive manner.

CHAPTER TABLES AND FIGURES

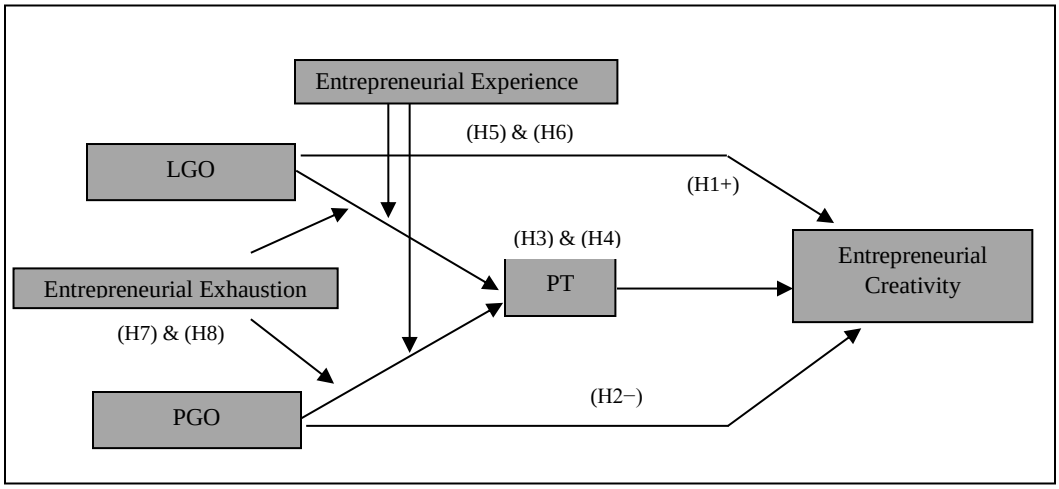


**Figure 4.1:** Conceptual model of Entrepreneurial Creativity

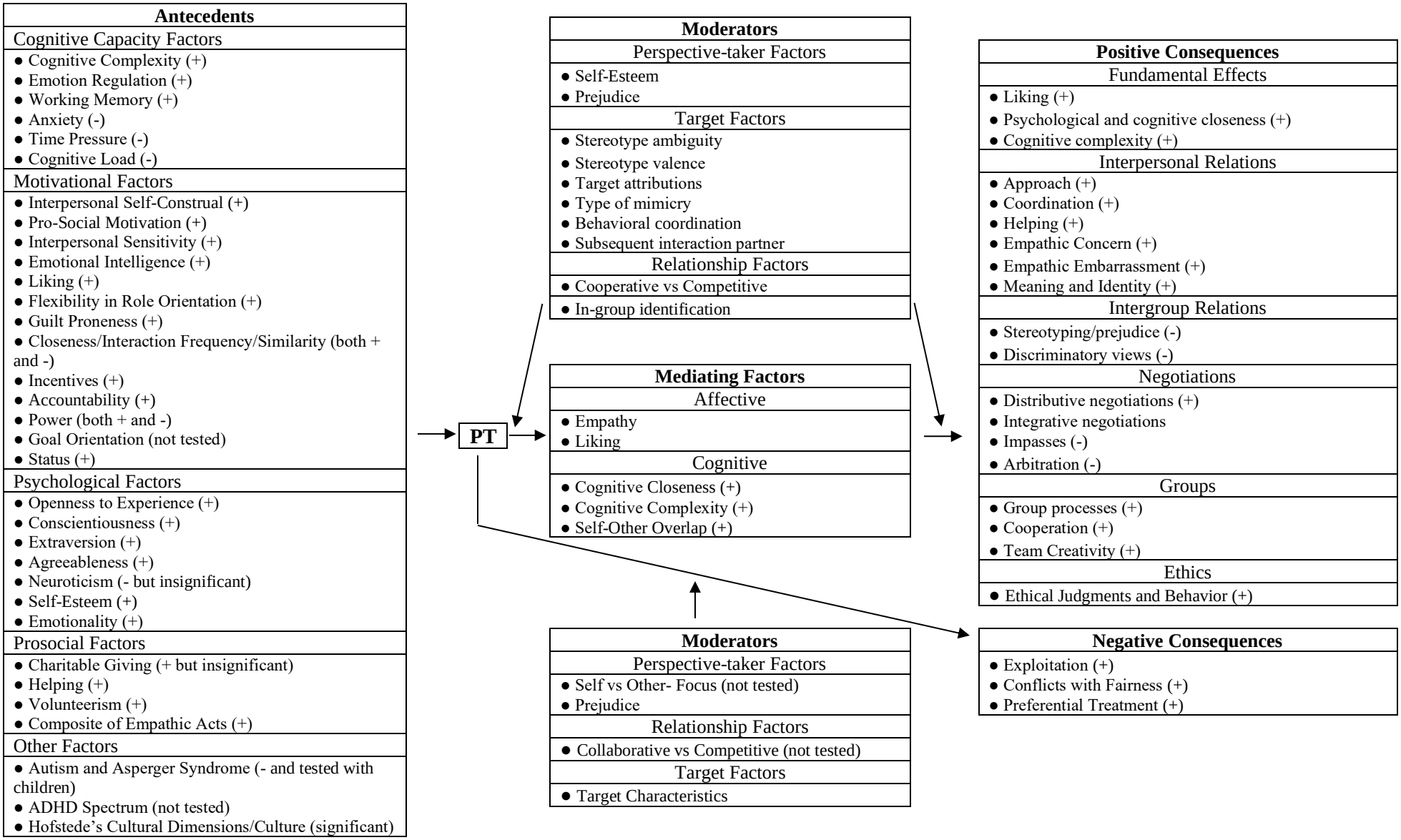


**Figure 4.2:** Antecedents and consequences of PT; Adapted from (Ku, Wang, & Galinsky, 2015) and extended to reflect subsequent research on PT.

**Table 4.1:** Descriptive Statistics and Correlations for Study 1

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. PT | 5.35 | 0.91 | 1.00 | | | | | | | | | | | | |
| 2. Gender | 0.58 | 0.50 | 0.05 | 1.00 | | | | | | | | | | | |
| 3. Age | 21.17 | 1.94 | -0.18 | -0.21 | 1.00 | | | | | | | | | | |
| 4. LGO | 5.20 | 1.18 | 0.07 | -0.13 | 0.06 | 1.00 | | | | | | | | | |
| 5 PGO-Approach | 4.79 | 1.16 | 0.04 | -0.03 | -0.15 | 0.34** | 1.00 | | | | | | | | |
| 6. PGO-Avoidance | 3.66 | 1.18 | -0.16 | 0.13 | -0.17 | -0.06 | 0.26* | 1.00 | | | | | | | |
| 7. PM | 5.70 | 1.05 | 0.43*** | -0.04 | 0.00 | 0.29** | 0.10 | -0.05 | 1.00 | | | | | | |
| 8. IM | 4.83 | 1.15 | 0.39*** | -0.10 | 0.09 | 0.08 | 0.01 | -0.20 | 0.22* | 1.00 | | | | | |
| 9. EC | 3.97 | 1.65 | 0.16 | -0.25* | 0.05 | -0.08 | -0.11 | -0.10 | 0.11 | 0.04 | 1.00 | | | | |
| 10. Agreeableness | 4.10 | 1.88 | 0.25* | -0.10 | 0.06 | -0.26* | -0.31** | 0.13 | 0.04 | 0.16 | 0.11 | 1.00 | | | |
| 11. Conscientiousness | 4.08 | 1.84 | -0.23* | -0.03 | -0.02 | -0.17 | -0.06 | 0.16 | 0.08 | 0.15 | 0.18 | 0.05 | 1.00 | | |
| 12. Psychological Ownership | 3.82 | 1.75 | -0.21* | -0.03 | -0.06 | -0.22* | -0.16 | 0.06 | -0.04 | -0.12 | -0.07 | 0.12 | 0.27** | 1.00 | |
| 13. Openness | 3.52 | 1.62 | 0.08 | -0.20 | 0.00 | -0.19 | -0.14 | 0.03 | 0.01 | -0.16 | 0.02 | 0.11 | 0.24* | 0.25* | 1.00 |

Notes: N =103
* p<0.05, ** p<0.01, *** p<0.001. Two-tailed tests.

**Table 4.2:** Hierarchical Regression Results of Study 1

| | 1 | 2 |
|---|---|---|
| | **PT** | **PT** |
| Gender | 0.11 | 0.17 |
| | (0.187) | (0.182) |
| Age | -0.039 | -0.059 |
| | (0.048) | (0.047) |
| Pro-Social Motivation | 0.341**** | 0.346**** |
| | (0.099) | (0.099) |
| Intrinsic Motivation | 0.309*** | 0.272*** |
| | (0.095) | (0.092) |
| Empathic Concern | 0.037 | 0.069 |
| | (0.103) | (0.104) |
| Agreeableness | -0.086 | -0.091 |
| | (0.091) | (0.089) |
| Consciousness | -0.071 | -0.047 |
| | (0.099) | (0.097) |
| Openness | 0.035 | 0.007 |
| | (0.102) | (0.099) |
| Psychological ownership | -0.196* | -0.105 |
| | (0.102) | (0.104) |
| LGO | | 0.931**** |
| | | (0.097) |
| PGO-Approach | | 0.639**** |
| | | (0.093) |
| PGO-Avoidance | | -0.617**** |
| | | (0.098) |
| Constant | 2.4027** | 1.751 |
| | (0.03) | (0.154) |
| N | 103 | 103 |
| Adjusted $R^2$ | 0.59 | 0.70 |

Standard Errors in parentheses

* *p<.10,* ***p<.05,* ****p<.01,* *****p<0.001*

**Table 4.3:** Descriptive Statistics and Correlations for Study 2

| Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Entrepreneurial Creativity | 1.75 | 0.65 | 1.00 | | | | | | | | | | | | | |
| 2. LGO | 5.76 | 0.77 | .54** | 1.00 | | | | | | | | | | | | |
| 3. PGO-Approach | 4.53 | 1.03 | -.27** | .16 | 1.00 | | | | | | | | | | | |
| 4. PGO-Avoidance | 4.61 | 1.51 | -.51** | -.27** | -.17 | 1.00 | | | | | | | | | | |
| 5. PT | 5.55 | 1.06 | .45** | .32** | .39** | .33** | 1.00 | | | | | | | | | |
| 6. Entrepreneurial Exhaustion | 5.01 | 1.42 | .09 | -.14 | -.08 | -.07 | .07 | | | | | | | | | |
| 7. Age | 22.57 | 1.57 | -.00 | .13 | .02 | .10 | -.10 | -.32** | | | | | | | | |
| 8. Gender | 0.65 | 0.48 | .02 | .10 | -.07 | .11 | -.09 | -.04 | -.08 | 1.00 | | | | | | |
| 9. Consciousness | 3.82 | 0.60 | -.05 | -.09 | .06 | -.15 | -.02 | -.14 | -.02 | 0.15 | 1.00 | | | | | |
| 10. Intrinsic Motivation | 4.08 | 1.49 | .06 | .18 | .22* | .02 | .02 | -.35** | .30** | -.29** | .09 | 1.00 | | | | |
| 11. Empathic Concern | 5.43 | 1.05 | .08 | .10 | .12 | -.11 | .45* | .08 | .09 | -.21* | .16 | .12 | 1.00 | | | |
| 12. Entrepreneurial Self-efficacy | 5.38 | 1.12 | .26* | .38** | .09 | -.16 | .07 | -.05 | .02 | .23* | .18 | .14 | .13 | 1.00 | | |
| 13. Passion for Inventing | 5.36 | 0.96 | .34* | .48** | .20 | -.23* | .30** | -.10 | -.02 | .08 | .12 | .16 | .24* | .65* | 1.00 | |
| 14. Passion for Founding | 5.28 | 1.23 | .14 | .22 | .19 | -.05 | .11 | .02 | .11 | .27* | .06 | .09 | .17 | .44** | .59** | 1.00 |

Notes: N = 88

* p < .05. ** p < .01, *** p < .001. Two-tailed tests.

**Table 4.4:** Structural Model Results of Study 2

| **Predicted and tested relationship** | **Estimates** | **t-value (sig.)** |
|---|---|---|
| H1: LGO→ Creativity | 0.585 | 4.50*** |
| H2: PGO-Approach→ Creativity | -0.274 | -5.40*** |
| H2: PGO-Avoidance→ Creativity | -0.285 | -5.97*** |
| LGO→ PT | 0.401 | 2.40* |
| PGO-Approach→ PT | 0.271 | 3.65*** |
| PGO-Avoidance → PT | -0.192 | 3.87*** |
| PT→ Creativity | 0.298 | 3.51*** |
| Age → Creativity | -0.191 | -0.14 |
| Gender→ Creativity | -0.171 | -0.85 |
| Entrepreneurial Self-efficacy→ Creativity | 0.164 | 1.38 |
| Entrepreneurial Passion for Inventing→ Creativity | 0.021 | 1.38* |
| Entrepreneurial Passion for Founding→ Creativity | 0.20 | 2.00* |
| Intrinsic Motivation→ Creativity | 0.031 | 0.46*** |
| Empathic Concern→ Creativity | 0.189 | 1.90* |
| Consciousness→ Creativity | -0.028 | -0.50 |
| Intrinsic Motivation→ PT | -0.050 | -0.71 |
| Empathic Concern→ PT | 0.439 | 3.99*** |

*$p < .10$. **$p < .05$. ***$p < .01$. ****$p < .001$. Two-tailed tests.

**Table 4.5:** Mediator Model Results of Study 2

| **Effects of LGO on Entrepreneurial Creativity** | | | | | |
|---|---|---|---|---|---|
| | **Effect** | **SE** | **t-stat** | **LL CI** | **UL CI** |
| **Total** | 0.617 | 0.1032 | 5.9830 | 0.412 | 0.823 |
| **Direct** | 0.505 | 0.1014 | 4.9740 | 0.303 | 0.706 |
| **Indirect Effects of GO on Entrepreneurial Creativity through PT** | | | | | |
| | | **Effect** | **SE** | **LL CI** | **UL CI** |
| Indirect effect | | 0.1130 | 0.0451 | 0.0334 | 0.2108 |
| **Effects of PGO-Approach on Entrepreneurial Creativity** | | | | | |
| | **Effect** | **SE** | **t-stat** | **LL CI** | **UL CI** |
| **Total** | -0.165 | 0.076 | -2.153 | -0.318 | -0.013 |
| **Direct** | -0.231 | 0.078 | -2.962 | -0.386 | -0.076 |
| **Indirect Effects of PGO-Approach on Entrepreneurial Creativity through PT** | | | | | |
| | | **Effect** | **SE** | **LL CI** | **UL CI** |
| Indirect effect | | 0.066 | 0.035 | 0.003 | 0.138 |
| **Effects of PGO-Avoidance on Entrepreneurial Creativity** | | | | | |
| | **Effect** | **SE** | **t-stat** | **LL CI** | **UL CI** |
| **Total** | -0.285 | 0.0478 | -5.9671 | -0.380 | -0.190 |
| **Direct** | -0.226 | 0.0472 | -4.7805 | -0.320 | -0.132 |
| **Indirect Effects of PGO-Avoidance on Entrepreneurial Creativity through PT** | | | | | |
| | | **Effect** | **SE** | **LL CI** | **UL CI** |
| Indirect effect | | -0.0595 | 0.0213 | -0.1041 | -0.0221 |

**Table 4.6:** Latent Moderated Mediation Results for Study 2

| | DV=PT | | | | DV = Creativity | | | |
|---|---|---|---|---|---|---|---|---|
| Variables | β | SE | t | Sig | β | SE | t | Sig |
| LGO | 0.486 | 0.097 | 4.991 | 0.0000**** | 0.250 | 0.067 | 3.706 | 0.0004**** |
| PGO-Approach | 0.308 | 0.085 | 3.619 | 0.0005*** | -0.126 | 0.036 | -3.546 | 0.0006**** |
| PGO-Avoidance | -0.590 | 0.150 | -3.941 | 0.0002*** | -0.196 | 0.053 | -3.370 | 0.0000**** |
| Entrepreneurial Exhaustion | -0.525 | 0.045 | -11.697 | 0.0000**** | | | | |
| LGO × Entrepreneurial Exhaustion | -0.080 | 0.036 | -2.234 | 0.0284** | | | | |
| PGO-Approach × Entrepreneurial Exhaustion | -0.037 | 0.021 | -1.714 | 0.0905* | | | | |
| PGO-Avoidance × Entrepreneurial Exhaustion | -0.122 | 0.032 | -3.858 | 0.0002**** | | | | |
| PT | | | | | 0.311 | 0.040 | 4.747 | 0.0000**** |

Notes: N= 88; Reports Standardized Coefficients

*$p < .10$. **$p < .05$. ***$p < .01$. ****$p < .001$. Two-tailed tests.

**Table 4.7:** Direct, Indirect, and Total Effects for Study 2

| | | Direct Effects | | Indirect Effects | | Total effects | |
|---|---|---|---|---|---|---|---|
| Variable | Moderator | DV=PT | | DV = Creativity | | DV = Creativity | |
| LGO | Entrepreneurial Exhaustion | | | | | | |
| | Low | .63*** | [.37, .89] | .20*** | [.10, .31] | .45*** | [.31, .58] |
| | High | .34*** | [.14, .54] | .11** | [.04, .25] | .36*** | [.22, .49] |
| PGO-Approach | Entrepreneurial Exhaustion | | | | | | |
| | Low | .51*** | [.28, .75] | .20*** | [.09, .29] | .07** | [.01, .13] |
| | High | -.09 | [-.40, .22] | -.04 | [-.14, .12] | -.17** | [-.28, -.01] |
| PGO-Avoidance | Entrepreneurial Exhaustion | | | | | | |
| | Low | -.37*** | [-.63, -.11] | -.14** | [-.18, -.01] | -.31*** | [-.20, -.42] |
| | High | -.81*** | [-1.18, -.44] | -.24** | [-.32, -.03] | -.44*** | [-.55, -.33] |

Notes: N= 88. Standardized coefficients. Figures in brackets are 95% confidence intervals.

Low = mean -1SD; high = mean +1SD.

* $p < .05$. ** $p < .01$. *** $p < .001$. Two-tailed tests.

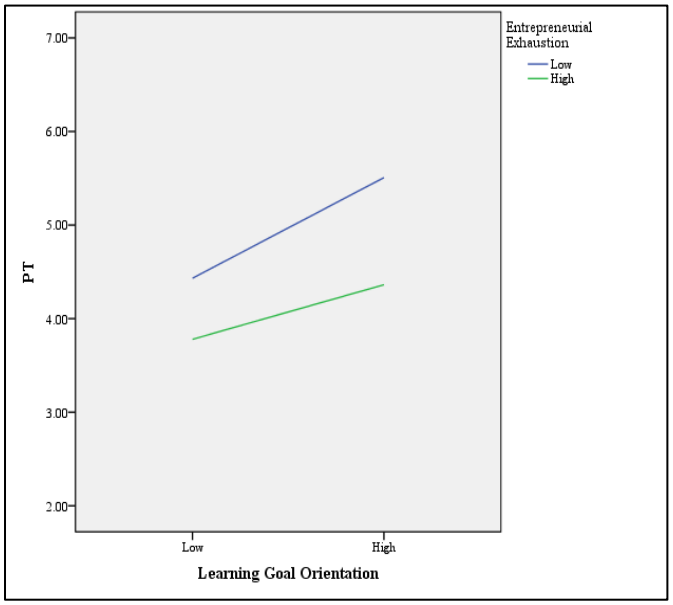


**Figure 4.3 Panel a:** The effects of LGO on PT at low and high levels of entrepreneurial exhaustion in Study 2.

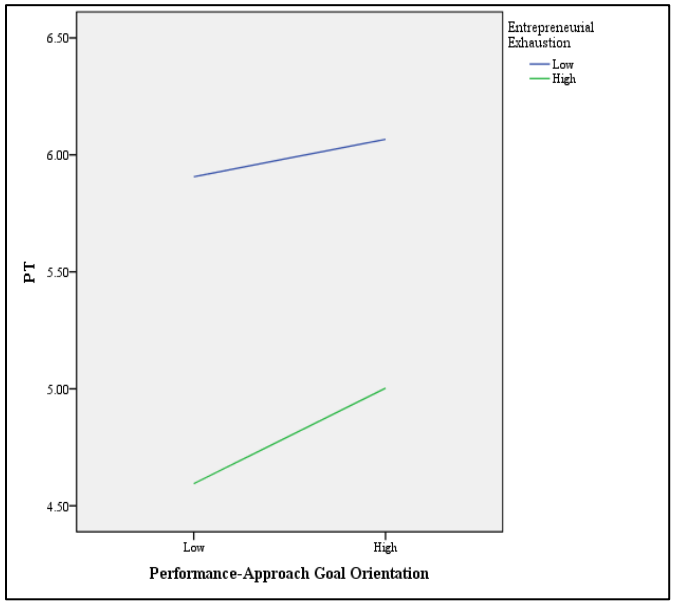


**Figure 4.3 Panel b:** The effects of PGO-Approach on PT at low and high levels of entrepreneurial exhaustion in Study 2.

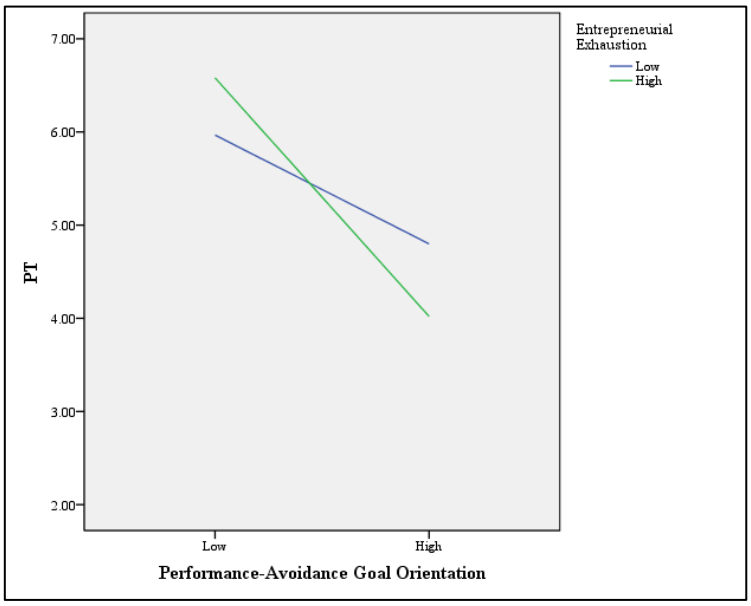


**Figure 4.3 Panel c:** The effects of PGO-Avoidance on PT at low and high levels of entrepreneurial exhaustion in Study 2.

**Table 4.8:** Descriptive Statistics and Correlations for Study 3

| Variable | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Creativity | 5.45 | 0.88 | 1 | | | | | | | | | | | | | | | | | |
| 2. LGO | 5.59 | 0.99 | .65** | 1 | | | | | | | | | | | | | | | | |
| 3. PGO-Approach | 4.52 | 1.19 | .23** | .38** | 1 | | | | | | | | | | | | | | | |
| 4. PGO-Avoidance | 3.24 | 1.31 | -.47** | -.57** | -.34** | 1 | | | | | | | | | | | | | | |
| 5. PT | 5.36 | 1.1 | .46** | .48** | .53** | -.49** | 1 | | | | | | | | | | | | | |
| 6. Exhaustion | 3.36 | 1.53 | -.21** | -.25** | .10 | .18* | -.02 | 1 | | | | | | | | | | | | |
| 7. Experience | 6.31 | 3.25 | .37** | .43** | .34** | -.53** | .69** | -.08 | 1 | | | | | | | | | | | |
| 8. Age | 36.93 | 9.31 | -.03 | .04 | -.01 | -.02 | .02 | .01 | .15* | 1 | | | | | | | | | | |
| 9. Gender | 1.43 | 0.50 | -.05 | .05 | .03 | .04 | .05 | .14 | .04 | .22** | 1 | | | | | | | | | |
| 10. Education | 4.40 | 1.25 | .07 | .05 | .10 | .022 | -.00 | -.03 | .10 | .07 | .03 | 1 | | | | | | | | |
| 11. Consciousness | 4.72 | 0.59 | .23** | .22** | .05 | -.21** | .21** | -.17* | .20** | .07 | -.02 | .13 | 1 | | | | | | | |
| 12. Self-efficacy | 3.74 | 0.72 | .49** | .45** | .22** | -.26** | .27** | -.14 | .22** | -.07 | -.01 | .06 | .13 | 1 | | | | | | |
| 13. Inventing Passion | 5.62 | 0.98 | .60** | .72** | .39** | -.45** | .48** | -.18* | .41** | -.01 | -.01 | .08 | .26** | .47** | 1 | | | | | |
| 14. Founding Passion | 5.83 | 0.95 | .61** | .25** | -0.2** | -.26** | .18 | -.04 | .56** | -.09 | .03 | .02 | .30** | .41** | 0.7** | 1 | | | | |
| 15. Hours Worked | 12.47 | 17.3 | -.01 | -.02 | -.13 | .07 | -.07 | .02 | -.04 | .03 | .14 | -.10 | -.07 | .01 | -.03 | 0.04 | 1 | | | |
| 16. Industry | 6.15 | 2.87 | -.02 | -.16* | -.18* | -.02 | -.08 | .11 | -.11 | .06 | .18* | -.06 | -.12 | -.17* | -.16* | 0.11* | .06 | 1 | | |
| 17. Firm Size | 1.34 | 1.18 | -.05 | -.02 | .16* | -.06 | .10 | -.05 | .18* | -.07 | -.13 | .08 | -.01 | .22** | -.01 | 0.24* | -.12 | -.28** | 1 | |
| 18. Firm Age | 6.17 | 7.64 | .01 | .02 | -.06 | -.08 | .14 | -.06 | .32** | .32** | -.04 | -.06 | -.01 | .01 | .07 | -0.01 | -.04 | -.07 | .11 | 1 |

Notes: N = 173

* p < .05. ** p < .01, *** p < .001. Two-tailed tests.

**Table 4.9:** Structural Model Results of Study 3

| **Predicted and tested relationship** | **β coefficient** | **t-value (sig.)** |
|---|---|---|
| H1: LGO→ Creativity | 0.843 | 6.53**** |
| H2: PGO-Approach → Creativity | -0.190 | -3.72**** |
| H2: PGO-Avoidance → Creativity | -0.463 | -8.35**** |
| LGO→ PT | 0.642 | 5.02**** |
| PGO-Approach → PT | 0.163 | 1.94** |
| PGO-Avoidance → PT | -0.219 | 2.15** |
| PT→ Creativity | 0.381 | 5.60*** |
| Age → Creativity | -0.005 | -0.80 |
| Gender→ Creativity | -0.193 | -1.97* |
| Education→ Creativity | 0.031 | 0.83 |
| Hours Worked→ Creativity | 0.001 | 0.15 |
| Entrepreneurial Self-efficacy→ Creativity | 0.266 | 3.56**** |
| Entrepreneurial Passion for Inventing→ Creativity | 0.226 | 5.26**** |
| Entrepreneurial Passion for Founding→ Creativity | 0.064 | 0.90 |
| Consciousness→ Creativity | 0.061 | 1.28 |
| Firm Age→ Creativity | 0.002 | 0.31 |
| Firm Size→ Creativity | 0.104 | 1.73* |
| Industry→ Creativity | 0.015 | 0.63 |

* $p < .10$, ** $p < .05$, *** $p < .01$, **** $p < .001$. Two-tailed tests.

**Table 4.10:** Mediator Model Results of Study 3

| **Effects of LGO on Entrepreneurial Creativity** | | | | | |
|---|---|---|---|---|---|
| | **Effect** | **SE** | **t-stat** | **LL CI** | **UL CI** |
| **Total** | 0.619 | 0.0475 | 13.0272 | 0.525 | 0.713 |
| **Direct** | 0.551 | 0.0505 | 10.9030 | 0.451 | 0.650 |
| **Indirect Effects of GO on Entrepreneurial Creativity through PT** | | | | | |
| | | **Effect** | **SE** | **LL CI** | **UL CI** |
| Indirect effect | | 0.0772 | 0.0355 | 0.0145 | 0.1557 |
| **Effects of PGO-Approach on Entrepreneurial Creativity** | | | | | |
| | **Effect** | **SE** | **t-stat** | **LL CI** | **UL CI** |
| **Total** | -0.113 | 0.0434 | -2.6028 | -0.199 | -0.027 |
| **Direct** | -0.190 | 0.0511 | -3.7216 | -0.291 | -0.089 |
| **Indirect Effects of PGO-Approach on Entrepreneurial Creativity through PT** | | | | | |
| | | **Effect** | **SE** | **LL CI** | **UL CI** |
| Indirect effect | | 0.1036 | 0.0390 | 0.0371 | 0.1905 |
| **Effects of PGO-Avoidance on Entrepreneurial Creativity** | | | | | |
| | **Effect** | **SE** | **t-stat** | **LL CI** | **UL CI** |
| **Total** | -0.463 | 0.0555 | -8.3470 | -0.573 | -0.354 |
| **Direct** | -0.362 | 0.0503 | -7.1924 | -0.461 | -0.263 |
| **Indirect Effects of PGO-Avoidance on Entrepreneurial Creativity through PT** | | | | | |
| | | **Effect** | **SE** | **LL CI** | **UL CI** |
| Indirect effect | | -0.1322 | 0.0496 | -0.2415 | -0.0498 |

**Table 4.11:** Latent Moderated Mediation Results for Study 3

| | DV=PT | | | | DV = Creativity | | | |
|---|---|---|---|---|---|---|---|---|
| Variables | β | SE | t | Sig | β | SE | t | Sig |
| LGO | 0.292 | 0.090 | 3.228 | 0.0015*** | 0.435 | 0.077 | 5.676 | 0.0000**** |
| PGO-Approach | 0.402 | 0.080 | 5.058 | 0.0000**** | -0.114 | 0.055 | 2.080 | 0.0391** |
| PGO-Avoidance | -0.343 | 0.052 | -6.616 | 0.0000**** | -0.362 | 0.053 | -7.192 | 0.0000**** |
| Entrepreneurial Experience | 0.205 | 0.022 | 9.488 | 0.0000**** | | | | |
| LGO × Entrepreneurial Experience | 0.077 | 0.016 | 4.856 | 0.0000**** | | | | |
| PGO-Approach × Entrepreneurial Experience | 0.101 | 0.022 | 4.520 | 0.0000**** | | | | |
| PGO-Avoidance × Entrepreneurial Experience | 0.035 | 0.017 | 2.035 | 0.0435** | | | | |
| Entrepreneurial Exhaustion | -0.107 | 0.510 | -2.102 | 0.0370** | | | | |
| LGO × Entrepreneurial Exhaustion | -0.135 | 0.064 | -2.104 | 0.0370** | | | | |
| PGO-Approach × Entrepreneurial Exhaustion | -0.111 | 0.044 | -2.549 | 0.0117** | | | | |
| PGO-Avoidance × Entrepreneurial Exhaustion | -0.117 | 0.044 | -2.635 | 0.0092*** | | | | |
| PT | | | | | 0.280 | 0.079 | 3.532 | 0.0005**** |

Notes: N= 173; Reports Standardized Coefficients

* *p < .10*, ** *p < .05*, *** *p < .01*, **** *p < .001*. Two-tailed tests.

**Table 4.12:** Direct, Indirect, and Total Effects for Study 3

| Variable | Moderator | Direct Effects DV=PT | | Indirect Effects DV = Creativity | | Total effects DV = Creativity | |
|---|---|---|---|---|---|---|---|
| LGO | Entrepreneurial Experience | | | | | | |
| | High | .54*** | [.39, .68] | .06* | [.01, .12] | .50** | [.44, .56] |
| | Low | .29*** | [.11, .47] | .03* | [.01, .09] | .47** | [.43, .51] |
| PGO-Approach | Entrepreneurial Experience | | | | | | |
| | High | 0.65*** | [.40, .89] | .10*** | [.03, .19] | -.02 | [-.03, -.01] |
| | Low | 0.45*** | [.24, .65] | .07*** | [.02, .14] | -.04 | [-.11, -.03] |
| PGO-Avoidance | Entrepreneurial Experience | | | | | | |
| | High | -.12* | [-.23, -.02] | -.03* | [-.08, -.003] | -.39 | [-.43, -.35] |
| | Low | -.22** | [-.36, -.09] | -.06* | [-.13, -.01] | -.42* | [-.48, -.36] |
| LGO | Entrepreneurial Exhaustion | | | | | | |
| | High | 0.31** | [.11, .50] | .15* | [.04, .25] | .69** | [.47, .91] |
| | Low | 0.51*** | [.23, .79] | .25* | [.07, .41] | .59*** | [.37, .81] |
| PGO-Approach | Entrepreneurial Exhaustion | | | | | | |
| | High | 0.23* | [.03, .43] | .06* | [.01, .12] | -.05** | [-.08, -.03] |
| | Low | 0.57*** | [.36, .78] | .13* | [.05, .22] | .02** | [.01, .05] |
| PGO-Avoidance | Entrepreneurial Exhaustion | | | | | | |
| | High | -0.46*** | [-.62, -.30] | -.13** | [-.23, -.04] | -.49*** | [-.56, -.44] |
| | Low | -0.23* | [-.40, -.05] | -.06** | [-.14, -.01] | -.42* | [-.53, -.33] |

Notes: N= 173. Standardized coefficients. Figures in brackets are 95% confidence intervals.

Low = mean -1SD; high = mean +1SD.

* $p < .05$. ** $p < .01$. *** $p < .001$. Two-tailed tests.

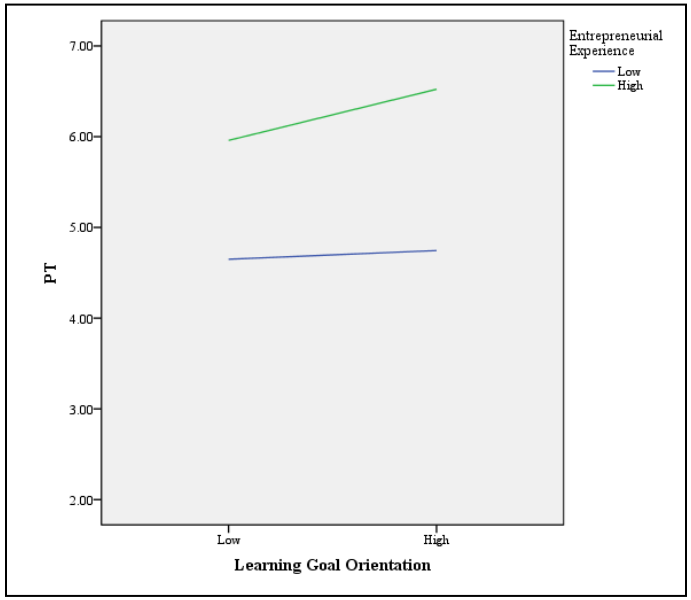


**Figure 4.4 Panel a:** The effects of LGO on PT at low and high levels of entrepreneurial experience in Study 3.

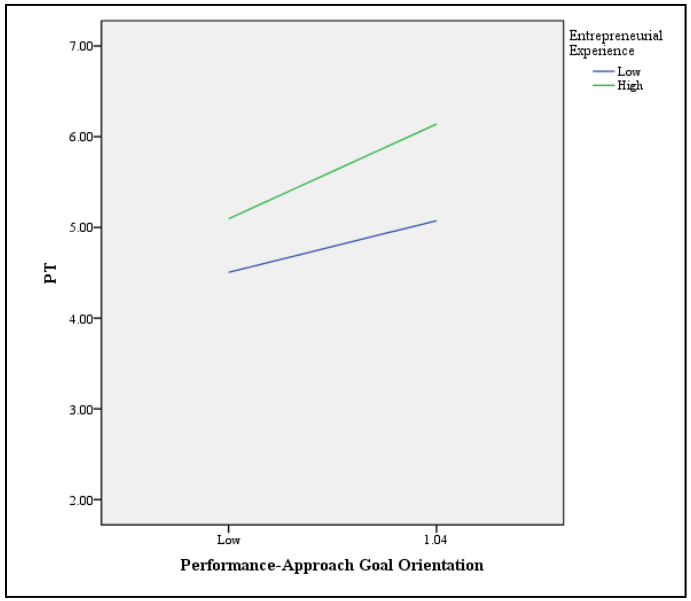


**Figure 4.4 Panel b:** The effects of PGO-Approach on PT at low and high levels of entrepreneurial experience in Study 3.

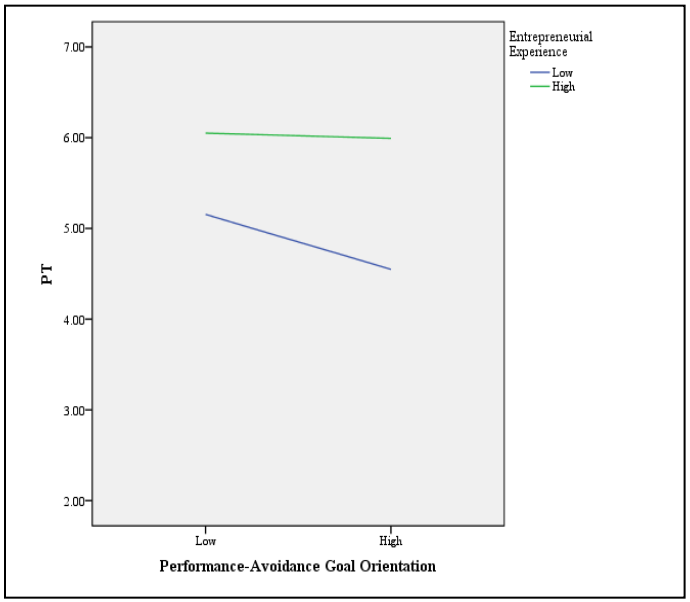


**Figure 4.4 Panel c:** The effects of PGO-Avoidance on PT at low and high levels of entrepreneurial experience in Study 3.

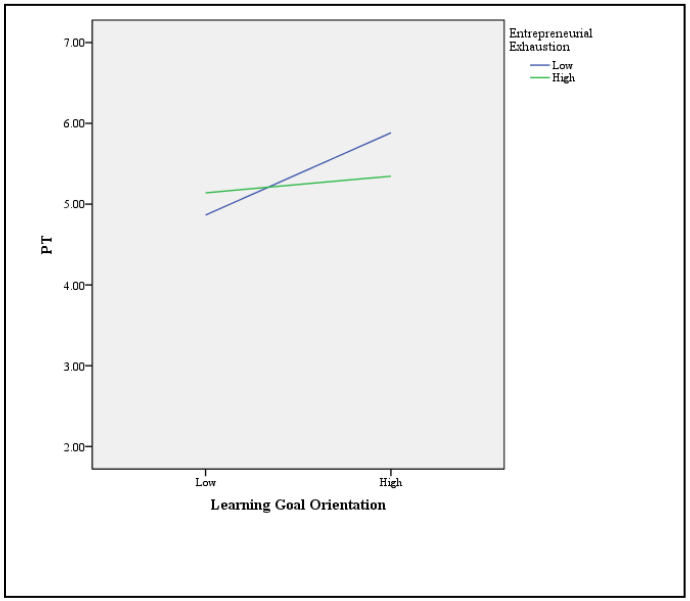


**Figure 4.5 Panel a:** The effects of LGO on PT at low and high levels of entrepreneurial exhaustion in Study 3.

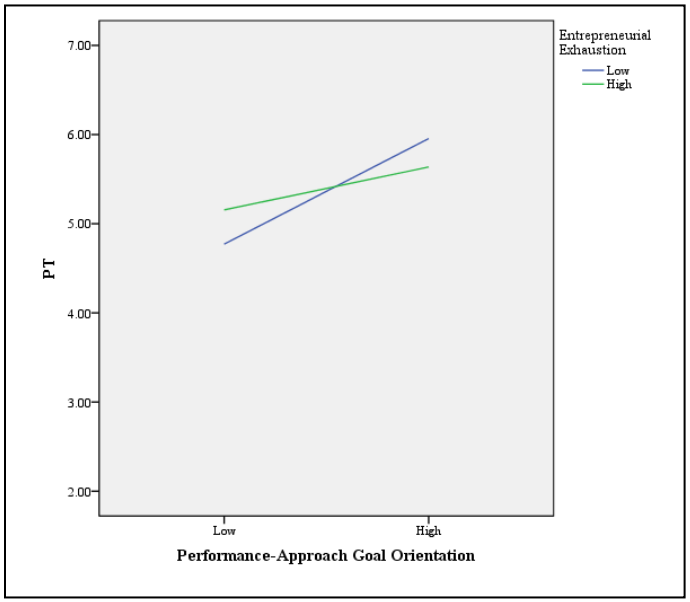


**Figure 4.5 Panel b:** The effects of PGO-Approach on PT at low and high levels of entrepreneurial exhaustion in Study 3.

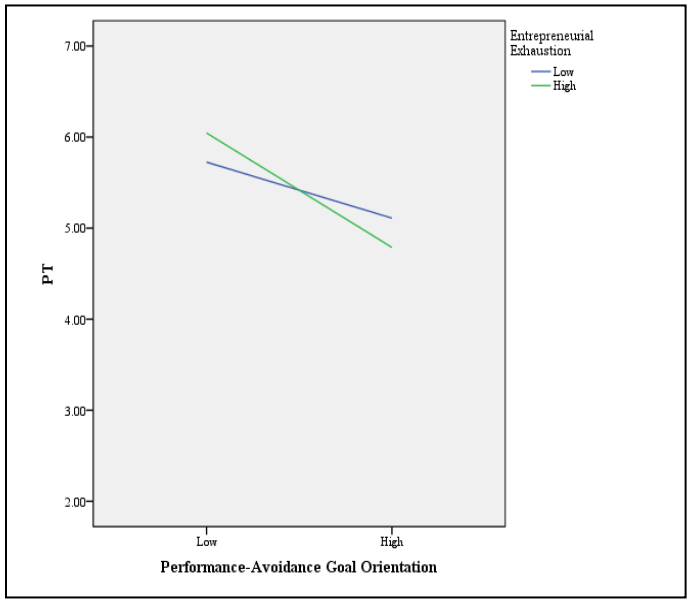


**Figure 4.5 Panel c:** The effects of PGO-Avoidance on PT at low and high levels of entrepreneurial exhaustion in Study 3.

# CHAPTER 5

# CONCLUSION

Entrepreneurial researchers have long been interested in identifying factors that predict entrepreneurial success. This research investigates physical and cognitive factors that drive entrepreneurial outcomes in the context of entrepreneurial pitching. As the way in which entrepreneurs communicate and seek resources from potential investors is critical for convincing the investors and securing finances from them (Bird & Schjoedt, 2009), the ability to deliver successful venture pitches is crucial for entrepreneurs. Therefore, we contribute to entrepreneurship literature by identifying physical and cognitive factors that can explain entrepreneurial outcomes and venture pitch success.

As vocally attractive individuals are judged more favorably than vocally unattractive individuals (Zuckerman & Driver, 1989), we first investigate if entrepreneurs' vocal attractiveness impacts individual investors' information retention and attraction towards the venture. Based on a controlled experiment with two samples, our findings suggest that vocal attractiveness has a significant positive effect on venture attraction. In addition, attractive voices make information retention easier than unattractive voices. Investors are more likely to retain more information from the presented elevator pitch and to feel attracted towards the venture when the elevator pitch is presented in an attractive voice than unattractive voice. We also find that attractive voices are easier to process and evoke positive affect, which in turn lead to increased information retention and venture attraction. In addition, we find that the effect of vocal attractiveness on processing fluency and positive affect depends on whether investors' expectations regarding the entrepreneurs' voice are negatively or positively violated. The results suggest that the indirect effect of processing fluency and positive affect on venture attraction and information retention is indeed moderated by expectancy violations. Moreover, negative violations of expectations regarding the entrepreneurs'

voice cues can lead to lower processing fluency and lower positive affect, which ultimately result in decreased information retention and venture attraction.

As human voice is a unique characteristic that carries socially relevant information about individual traits and personality (Belin et al., 2011), gender identity is often indexed in voice and speakers often express their gender identity of masculinity or femininity through voice (Biemans, 1999; Smith, 1985; Weirich & Simpson, 2018). Therefore, in second study we investigate the interactive effect of the congruence among entrepreneurs' sex, gendered voice and gendered products/services offered by the entrepreneurs on investors' decisions and preferences by analyzing the differences in funding success for role congruent entrepreneurs (masculine-voiced men and feminine-voiced women) and role incongruent entrepreneurs (feminine-voiced men and masculine-voiced women). Based on a controlled experiment, our findings suggest that gendered voice has a significant effect on investors' preferences and funding success. We find that participants are more likely to invest in ventures that are presented in a masculine voice. However, prior research has failed to incorporate the effect of gendered services while examining the effect of gender stereotypes on entrepreneurial outcomes. While masculinity is preferred in venture pitch presentation, such benefits are only available when entrepreneurs pitch masculine-type services. In case of pitching feminine-typed services, femininity is preferred over masculinity, even for male entrepreneurs. We also provide evidence that wholesale adoption of masculinity and aggressiveness can lead to negative outcomes for female entrepreneurs as such portrayal of masculinity contradicts with investors' gender role stereotypes.

Entrepreneurial creativity is important for identifying business opportunities, facilitating entrepreneurial innovation, and developing competitive advantages, as such, it is crucial to identify the antecedents of entrepreneurial creativity. In the third study, we examine cognitive processes and factors that drive entrepreneurs' levels of creativity. Specifically, we investigate entrepreneurial goal orientations (GO) and perspective-taking (PT) as antecedents to entrepreneurial creativity. In addition, we examine the contingent impact of personal-level moderators—entrepreneurial

experience and entrepreneurial exhaustion—on the relationships among GO, PT, and entrepreneurial creativity. Using two cross-sectional survey of entrepreneurship students and a two-wave, lagged survey of entrepreneurs, we show that GO is associated with entrepreneurial creativity and PT mediates the relationship between GO and entrepreneurial creativity. We also find that the indirect effect of GO on creativity through PT is contingent upon entrepreneurial experience and entrepreneurial exhaustion.

Our studies disentangle the role of physical traits and cognitive processes on entrepreneurial success and creativity and our findings have important implications for entrepreneurship research. Future research should delve further into examining other physical and cognitive traits to explore how malleable characteristics that are omnipresent in everyday lives can influence entrepreneurial outcomes. Most of the previous research in entrepreneurship has focused on entrepreneurs' personality or leadership qualities to explain new venture success. Our research put forwards factors such as vocal cues and attractiveness that has been largely overlooked by the entrepreneurial researchers.

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# APPENDICES

**Appendix A:** Literature Review of Entrepreneurial Pitching

| Author & Year | RQ | Theory | Findings |
|---|---|---|---|
| Elsbach & Kramer (2003) | How do expert decision makers use perceived attributes and industry prototypes to assess the creativity of others? How the interactions between experts and targets affect creativity assessments? | Personality attributes impact creativity assessments but social judgement theory argues that when individuals assess others' creativity, they compare/match others' attributes with the features of their implicit model of creativity, which consists of few basic categories or prototypes. | Dual-process social judgment model in which others' creativity is assessed through two processes--1) Person categorization, use of behavioral and physical cues to match pitchers with seven creative and uncreative prototypes, and 2) relationship categorization, use of relational cues and self-perceptions to match pitchers with two relational prototypes. |
| Clark (2008) | Do entrepreneurs' communication skills and personal attributes influence investor decision-making? | None | Level of investor interest is significantly related to their evaluations of the quality and content of the entrepreneurs' presentations. BAs' willingness to invest is higher for entrepreneurs who had the higher overall presentation score. However, BAs were unaware or reluctant to acknowledge the influence of presentational factors on their investment-related decisions. |
| Chen, Yao, & Kotha (2009) | Does VCs' perceptions of the entrepreneurs' displayed passion during business plan presentations influences their investment decisions? | The unimodel theory of persuasion suggesting that both issue- relevant and irrelevant information are processed through the same route. Also, motivation and cognitive ability determine receivers' effort in processing information. | Preparedness is positively related to the VC funding decision, whereas perceived passion is statistically insignificant. Preparedness partially mediated the relationship between business plan quality and the funding decision. |
| Blazkova (2011) | Explores the use of small narrative as a means of | Self-categorization theory that outlines the responsiveness of social identity to | To communicate professional competence, the speakers rely on the success story as the chief |

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| | communicating the speaker's professional competence. | immediate social context. By matching social categories to the properties of the given social context, individuals activate the salient identity that makes more sense for them given the context and his/ her position in it. | master narrative and use predominantly the problem-solution generic pattern. The problem and solution phases tend to involve increased deployment of high-involvement lexis such as hyperbole and extreme case formulations and they are often framed as constructed dialogue. |
| Yusuf (2011) | Investigates the charismatic relationship between the entrepreneur and external stakeholders. | Literature on charismatic leadership and dramaturgy metaphor to explain how entrepreneurs can manipulate the interactions with investors and engage in impression management or image building to project credibility and legitimacy. | The paper offers theoretical framework to suggest that entrepreneurs use drama and charisma as tools to persuade investors of their legitimacy. |
| Pollack, Rutherford, & Nagy (2012) | What specific entrepreneurial behavior increases the propensity for resource acquisition? | Narrative sensemaking theory in which entrepreneurs craft and tell a story and if properly enacted, the story convinces the investors to provide funding for the entrepreneurs' companies. | Entrepreneurs' perceived preparedness is significantly related to the amount of funding received and this relation is fully mediated by cognitive legitimacy. |
| Huang, Frideger, & Pearce (2013) | Does speaking with a nonnative accent reduce the likelihood of receiving new-venture funding? | Nonnative speaker bias that operates through evaluators' assumptions about a nonnative speaker's political skill. Non-native accent leads evaluators to assume that the candidate for funding lacks political skill to be successful. | Nonnative accent reduced the chances of receiving funding for entrepreneurs in new-venture pitch competitions and perceived political skill mediates the relationship between accent and entrepreneurial funding. |
| Garud, Schildt, & Lant (2014) | Examines the role that projective stories play in setting expectations, and the dynamics that ensue | Sociology of expectations literature suggesting cognitive and pragmatic expectations that entrepreneurs set while pitching but setting up these expectations is not easy and can lead to lack of cognitive legitimacy. | Projective and revised storytelling can help maintaining or regaining legitimacy. |

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| Brooks, Huang, Kearney, & Murray (2014) | Do investors consider gender and physical attractiveness of the entrepreneurs while making investment decisions? | Gender imbalance documented in entrepreneurship | A profound and consistent gender gap in entrepreneur persuasiveness. Investors prefer pitches presented by male entrepreneurs more than those by female entrepreneurs, although the content of the pitch remains same. Attractive males were particularly persuasive, whereas physical attractiveness did not matter for females. |
| Ward (2015) | Applying dual process theory of creativity to entrepreneurial pitches | Dual process judgement theory is applied to creativity in which evaluators evaluate the creativity of ideas through cognitive and affective routes. | Creativity assessed through personal commitment positively influenced investors' decision to offer funding. |
| Huang & Pearce (2015) | Examines early-stage entrepreneurial investment decision making under conditions of extreme uncertainty | Existing literature on decision making and risk in organizations, intuition, and theories of entrepreneurial financing to explain that BAs use intuition to make investment decision. | BAs have clear objectives and they rely on a combination of expertise-based intuition and formal analysis in which intuition trumps analysis. Under extreme uncertainty, BAs use their 'gut feel' to make investment decisions. |
| Daly & Davy (2015) | Tests the role of language and discursive activity in entrepreneurial resource acquisition. | None | Most pitches can be structured using a ten-stage discourse framework and typical linguistic exponents and rhetorical devices can be identified. |
| Latham & Tello (2016) | Examines whether certain aspects of visual presentations are more likely to elicit stakeholder interest | Information visualization theory which focuses on the way individuals process, assimilate, and act upon the visual presentation of data, information, and knowledge. | Visualization matters in poster presentation: posters that included specific visual devices garnered a higher level of interest among prospective stakeholders, including investors and collaborators. |

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| Gafni, Marom, & Sade (2016) | Should entrepreneurs focus their business pitches on themselves or on the business idea? Does frequently mentioning entrepreneur's name impact the success of fund-raising on Kickstarter? | None | Entrepreneurs of artistic projects focus their pitches relatively more on themselves and mention their names more frequently on their Kickstarter pages than entrepreneurs of technology projects. Mentioning names is positively associated with the funding success of the campaign for the art-related projects as mentioning names may increase trust and familiarity of potential backers. |
| Jeffrey, Lévesque, & Maxwell (2016) | What BAs consider when making investment decisions | Judgment and decision-making (JDM) theory suggesting that experienced BAs adopt decision shortcuts to conserve cognitive effort over time while deciding whether to invest. | BAs save cognitive resources by (1) aggregating the eight criteria into composite measures of risk and return, (2) treating risk and return in a non-compensatory manner, and (3) using a threshold model of rejection to further reduce the cognitive effort required to analyze opportunities. |
| Davis, Hmieleski, Webb, & Coombs (2017) | How funders' perceived product creativity impacts crowdfunding performance partially via eliciting positive affective reactions and how funders' perceived entrepreneurial passion influences the effect of funders' perceived product creativity on crowdfunding performance? | Affective events theory (AET) that predicts how certain types of events may engender affective reactions in individuals. Such affective reactions influence individuals' attitudes and actions. | Perceived product creativity is positively related to crowdfunding performance and the relationship is partially mediated by funders' positive affective reactions. The indirect effect is contingent upon the level of perceived entrepreneurial passion, such that the effect is larger for funding pitches presented by entrepreneurs who are perceived as highly passionate. |
| Clingingsmith & Shane (2017) | How pitch training affects entrepreneurs' odds of continued funding discussions with investors? | The accredited investors' venture interest is viewed as a real option, which is a function of investors' experience and the information provided in the pitches. | The results suggest that pitch training increases pitch performance for high quality ideas and the effect is more positive for experienced than inexperienced investors |

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| Johnson, Stevenson, & Letwin (2018) | Examines the implicit funder biases and stereotype processes in crowdfunding decisions. | Stereotype content model that focuses on the perceived trustworthiness and competence as the two-universal dimension of stereotypical judgements. | The authors find that females have an advantage over males in the crowdfunding context as investors' stereotypical judgements interact with entrepreneur's gender to impact the perceived trustworthiness of the entrepreneur, and thus influence the financial backing in crowdfunding. |
| Kanze, Huang, Conley, & Higgins (2018) | Whether gender disparity exists in venture funding | Gender bias | Investors tend to ask promotion- (prevention-) focused questions to male (female) entrepreneurs, and entrepreneurs tend to respond with matching regulatory focus. However, responding to prevention focused questions with promotion-focused answers can increase funding. |
| Grimes (2018) | How individuals embrace change in their creative ideas originating from external sources without destabilizing their identities? | Creative revision and identity constraints-- external feedback may make the entrepreneurial ideas more viable but entrepreneurs may view aspects of their creative ideas as linked to their self-concepts, this can trigger resistance toward revision. | The paper suggests an identity-based process model of creative revision that highlights differences in founders' psychological ownership of their ideas and how those differences affect subsequent revision efforts. |
| Huang (2018) | How investors choose to make investments that they know are extremely risky? How investor gut feel enables them to look beyond the extreme risk, and make such risky investment? | The Role of Intuition in Judgment and Decision-Making | "Gut feeling" is an elaborate "intuiting process," that enables investors to make overly risky investments. Investors are guided by a predisposed stance on risk and uncertainty and they cognitively and emotionally reframe investment risk into a compelling narrative that surpasses avoidance behavior and leads investors to invest. |
| Ciuchta, Letwin, Stevenson, McMahon, & Huvaj (2018) | How important it is for entrepreneurs to be 'coachable' for investment decision. | Signaling and social exchange theory to suggest that the entrepreneur's level of coachability serves as a key signal regarding how the entrepreneur will approach future exchange relationships. | Entrepreneurial coachability functions as a viable signal in a pitch setting, but this impact is conditional on the investor's prior coaching experience. |

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| Lee & Huang (2018) | Examines if emphasizing a venture's social environmental welfare benefits can diminish penalties imposed to female-led ventures by eliciting stereotypically feminine attributions of warmth | Gender role theory suggesting that gender roles lead to gender stereotypes, which align with the dimensions of warmth and competence. Social impact framing helps entrepreneurs to appear warmer than others and may thus achieve greater entrepreneur-venture "fit" by creating congruity between evaluator perceptions of the venture entrepreneur. | Social impact framing increases attributions of warmth for all entrepreneurs but with positive consequences on business evaluation only for female-led ventures, for which increased perceptions of warmth attenuate female entrepreneurs' gender role incongruity. |
| Smith & Viceisza (2018) | Whether pitch competitions are valuable because they lower financial barriers for winners or provide a signal of quality. | None | Funding provided in the Shark Tank relaxes an internal financial constraint but does not signal the quality of the venture to potential outside investors. Women asks and receives significantly lower funding than men. |
| Poczter & Shapsis (2018) | Are women less likely to secure angel financing because of their gender alone? | Gender disparities found in the prior literature | While the yield rates between male and female teams do not differ, a gender disparity in the amount of angel funding does exist. Also, limitations to angel financing of female entrepreneurial ventures may be partly self-imposed as females initially offer higher equity stakes for less capital. |
| Balachandra, Briggs, Eddleston, & Brush (2019) | How an entrepreneur's sex and gender-stereotyped behaviors influence investors' decisions? | Gender role theory suggesting that men and women tend to occupy different roles in society, so there are differences in what are considered acceptable behaviors for men and women that reflect gender stereotypes. | Gender stereotypes influence venture capitalists' evaluations, as bias exists against ventures pitched by entrepreneurs who display feminine-stereotyped behaviors during funding pitches, regardless of whether they are men or women. |

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| van Werven, Bouwmeester, & Cornelissen (2019) | How new venture founders construct narratives when trying to obtain an investment? | Narrative sensemaking theory to suggest that entrepreneurial narratives must be plausible and must resonate with an audience to be effective. | New venture founders use four micro-level rhetorical strategies to make it more likely that their narratives are seen as plausible and resonant: (1) using enthymemes when discussing the venture's future, (2) 'talking as if' the venture's future product or performance is the present, (3) making explicit claims about the present state of product and market, and (4) supporting claims through arguments based on historical and current data. |
| Clarke, Cornelissen, & Healey (2019) | How entrepreneurs' figurative language and hand gestures during pitch presentation impacts investors' evaluation? | Framing in entrepreneurial pitching | Entrepreneurs use distinct pitching strategies that combine both verbal and nonverbal gestures. While the effect of the type of language used by entrepreneur has limited impact, gesturing to depict business ideas has a strong positive effect on investors' propensity to invest. |
| Stroe, Sirén, Shepherd, & Wincent (2019) | Investigates the antecedents of negative affect that entrepreneurs feel during performing early-stage entrepreneurial tasks | Affective events theory (AET) to examine how entrepreneurs' dispositional fear of failure leads to negative affect; Identity literature and dualistic model of passion to propose harmonious and obsessive passion as moderators of the positive relationship between dispositional fear of failure and negative affect. | There is a significant positive relationship between entrepreneurs' fear of failure and negative affect that they experience during pitching in an annual start-up competition. Also, passion moderates this positive relationship depending on whether the passion is harmonious or obsessive. |
| Jiang, Yin, & Liu (2019) | How entrepreneurs' displayed joy levels at peak moments and the time length of these peak moments during pitch presentations impact funding performance? | Gestalt characteristics theory (Ariely & Carmon, 2000) to argue that entrepreneurs' peak level of affective experiences form their summary evaluation regarding the event and event system theory (Morgeson et al., 2015) to suggest that at different phases of the | In the context of crowdfunding, it was found that there is a significant positive influence of peak displayed joy on funding performance, especially during the beginning and ending of a pitch. Also, the peak displayed joy duration has an inverted-U shaped relationship with funding performance |

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| | | event there is a temporal variation in individuals' emotions and preferences as they experience the events. | such that funding performance decreases if peak level of is displayed for extended time length. |
| Jachimowicz, To, Agasi, Côté, & Galinsky (2019) | Can interpersonal processes explain the positive effects of passion on professional success? | Recent conceptualization of passion suggesting that passion leads individuals to continuously seek engagement with the target of passion. | Using televised entrepreneurial pitches, the results suggest that entrepreneurs who expressed passion towards their ventures received increased financial support from the observers only when the observers judge the expression of passion as appropriate. |

## Appendix B: Manipulation of Vocal Attractiveness

In both study 1 and 2, We manipulated **vocal pitch, amplitude, pauses, and speech rate**— to generate voices ranging from attractive to unattractive for male and female speakers (DeGroot et al., 2011; DeGroot & Motowidlo, 1999) to investigate if listening to unattractive or attractive voices impacts information processing and attraction towards the venture

**Vocal Pitch** is the relative highness or lowness of a tone as perceived by the listeners. Pitch depends on the number of vibrations per second produced by the vocal cords and pitch is the correlate of tone and voice intonation. Several psychology researchers have found that women with higher-pitched voices are perceived as more vocally attractive, (Feinberg et al., 2005; Nathan Pipitone & Gallup Jr, 2012) but the relation between voice pitch and female vocal attractiveness is not linear but inverted-U shaped—high-pitched voices in female are judged as more attractive up to an optimal pitch level (< 280 Hz) and high-pitched voices sound babyish and immature (Borkowska & Pawlowski, 2011). Using a sample of 144 males, Borkowska and Pawlowski (2011) showed that attractive ratings for female speakers are highest when the vocal pitch is around 262 Hz. We manipulate the voice pitch of the male and female speaker using voice morphing without altering the amplitude or formant frequencies of the voices to create the attractive and unattractive versions. The average vocal pitch of the female voice was 218.10 Hz. The vocal pitch dimensions are manipulated following Borkowska & Pawlowski, (2011) and Re, O'Connor, Bennett, & Feinberg (2012) as— attractive (high-pitched 261.9 Hz) and unattractive (low-pitched 184.57 Hz). While high-pitched female voices are deemed attractive, males with lower-pitched voices have consistently been found attractive across various studies. The average pitch for the male voice was 110.2 Hz. The vocal pitch dimensions of the male speaker are manipulated as—Attractive (low-pitched 91 Hz) and unattractive (high-pitched 140 Hz) following several authors. (Klofstad, 2016; Klofstad, Anderson, & Peters, 2012; Mayew et al., 2013; Puts, 2005; Puts et al., 2006; Re et al., 2012; Tigue, Borak, O'Connor, Schandl, & Feinberg, 2012).

**Vocal Amplitude** of the vibration impacts loudness. High amplitude voices reflect higher acoustic intensity and loudness. Amplitude can range from a whisper (SPL of 10 dB) to

shouting voices (SPL of 90 dB). To manipulate amplitude, the amplitude of the original male and female voice was measured using the mean Sound Pressure Level (SPL) in decibels. The SPL of the normal female voice was 58.92 dB and normal male voice was 62.45 dB. The attractive versions were kept in the normal conversational amplitude level (SPL of 50-60 dB) whereas the unattractive versions had relatively higher amplitude (SPL of 80-85 dB).

**Pauses & Speech Rate** also impact whether voices are deemed attractive or unattractive. We first measure the number of voice-breaks or non-voice time and duration of voice breaks or pauses in the original entrepreneurial pitches. Then we increase the number and duration of unintended pauses in the unattractive versions to manipulate the pauses whereas we decrease the number and duration of pauses in the attractive version. Finally, speech rate is the number of words spoken per minute. We decreased and increased the original entrepreneurial pitch speech rate by 12.5% to create attractive (12.5% increased speech rate) and unattractive (12.5% slower speech rate).

After creating the unattractive and attractive versions of the same elevator pitch, we had the elevator pitch rated by two independent speech analysists who were unaware of the objectives of the study. The speech analysists listened to the manipulated elevator pitches and rank the attractiveness of each manipulated speech using a 3-item scale ranging from attractive to unattractive. Both the analysts rated the unattractive (attractive) version as unattractive (attractive) and provided validity for our manipulation. We also collect a convenience sample of 55 graduate students ($M_{Age}$ = 38.15, $SD_{Age}$ =2.12, Female = 38%) who rated the vocal attractiveness of the manipulated voice. Both men and women participants rated the high-pitched voices as more attractive than the low-pitched voice for females. Also, both men and women participants rated the low-pitched voices as more attractive than the high-pitched voice for males.

## Appendix C: Experimental Materials

**Background information provided with the photograph**

Meet Ryan, who loves to see an opportunity or a challenge! He always tries to find better ways to do things. Ryan has just finished his MBA and is ready to start his own venture! Ryan is a driven professional who is looking for potential investors who can fund his business. Imagine you are one of the potential investors who is deciding whether to invest in Ryan's business.

You will now hear Ryan's elevator pitch. An elevator pitch is a short and formal presentation of a business idea, product or company by the entrepreneur.

**Appendix D:** Literature Review of Antecedents of Creativity/Entrepreneurial Creativity

| Authors | RQ | Design & Sample | Findings |
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| Amabile (1997) | Influence of intrinsic and extrinsic motivation on creativity | N/A | While entrepreneurial creativity arises when entrepreneurs are intrinsically motivated, synergistic extrinsic motivators that support skill development and rewards for competence are also important drivers of entrepreneurial creativity. |
| Feist (1998) | Meta-analysis of personality-artistic/scientific creativity relationship | 26 studies comparing scientists to non-scientists, 28 studies comparing creative to less-creative scientists, and 29 studies comparing artists to non-artists. | The largest effect sizes are found for openness, conscientiousness, self-acceptance, hostility, and impulsivity. Scientists and artists differ in personal traits that affect scientific and artistic creativity differently and reflect dispositional dimensions that separate artists from scientists. |
| Ardichvili, Cardozo, and Ray (2003) | Provides a theory of entrepreneurial opportunity identification | N/A | Entrepreneurs personality traits, social skills/networks, and prior knowledge drives entrepreneurial alertness, which is associated with high levels of entrepreneurial creativity and optimism that in turn facilitates opportunity recognition, development and evaluation. |
| Ma (2006) | Meta-analysis of the effect of creativity training on different creativity categories such as attitude, ideation with and without evaluation. | 34 articles investigating 268 effect sizes | The mean effect size of creativity training was 0.77 and different training programs/techniques facilitating creativity have different effect sizes. Also, age is a significant moderator as the older the participant, the higher was the effect size. |
| Parzefall, Seeck, and Leppänen (2008) | Review of individual, team, job and organizational factors that influence creativity | N/A | Several individual-level factors and personal characteristics such as cognitive capabilities, experience, technical and task knowledge, openness to new experience, self-confidence, and intrinsic motivation influence creativity at organizations. |
| Hirst, Knippenberg, | How individual differences in goal orientations and team | 25 cross-national R&D teams involving 198 employees | Learning goal orientation positively affects employee creativity but performance goal orientations--approach and avoid do not affect employee creativity. Team learning behavior bolster the |

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| and Zhou (2009) | context influence employee creativity? | | learning orientation and creativity relationships at intermediate levels of learning orientation than at high/low levels of learning orientation. Also, when team learning is high, the relationship between approach orientation and creativity becomes positive. |
| Ma (2009) | Meta-analysis of the environmental and personal correlates of creativity | 112 articles involving 2013 effect sizes | Individuals who achieved high scores on TTCT and psychopathological traits had high scores on creativity. Creative personality and openness have high predictive power than other personality traits. Cognitive abilities and environmental factors are also important variables associated with creativity. |
| Maddux, Adam, and Galinsky | How adaptation to foreign cultures or multicultural learning experiences facilitate creativity? | Experimental design; experiment 1&2: 43& 153 university students; experiment 3: 135 full-time MBA students. | Multicultural learning enables individuals to approach tasks from multiple perspectives and facilitates creativity. Also, functional learning in a multicultural context leads to increased creativity. |
| Fillis and Rentschler (2010) | What facilitates creativity in entrepreneurship? | N/A | Entrepreneurs are generally more imaginative and entrepreneurial environment is conducive to entrepreneurial creativity. Also, entrepreneurs are more likely to realize their creative potential and be leaders in an entrepreneurial culture as they feel more motivated and empowered in an entrepreneurial environment and culture. |
| Byron, Khazanchi, and Nazarian (2010) | Meta-analysis of the association between stressors and creativity | 76 experimental studies | The effect of stressors on creativity depends on how stress inducing the stressors are. Low and high stress inducing stressors lead to increased and decreased creativity, respectively. Also, anxiety, uncontrollability of the stress situation and social-evaluative threats moderates the stressor-creativity relationships. |

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| Hirst, Knippenberg, Chen, and Sacramento (2011) | How team bureaucratic context influences the goal orientation-employee creativity relationship? | 95 teams comprising 330 employees in Taiwan Customs Bureau | Learning and performance prove orientations do not have significant effect on creativity but avoid orientation negatively affects employee creativity. Bureaucratic practices (centralization and formalization) moderates these relationships-- at low centralization, learning and avoid orientations lead to increased creativity and al low formalization, prove orientation leads to increased creativity. |
| Shin, Kim, Lee, and Bian (2012) | How team diversity influences individual employee creativity? | 68 teams comprising 316 employees from China | There is no relationship between cognitive team diversity and team members' individual creativity. However, creative self-efficacy and transformational leadership moderates this relationship such that cognitive team diversity leads to positive individual creativity only when the team member has high levels of creative self-efficacy and transformational leadership. |
| Dayan, Zacca, and Benedetto (2013) | What are the effects of contextual and individual factors on entrepreneurial creativity? | 119 respondents with entrepreneurial experiences in UAE. | Resource related factors--resource access and resource possession do not directly affect but indirectly affect entrepreneurial creativity through alertness to opportunity. Individual factors--creative self-efficacy positively but expertise negatively affects entrepreneurial creativity. However, both creative self-efficacy and expertise have an indirect positive effect on entrepreneurial creativity through intrinsic motivation. |
| Leikin and Tovli (2014) | Does early bilingualism have effect on creativity for both mathematical and nonmathematical tasks? | 31 bilingual (N=15) and monolingual (N=16) children | Compared to monolingualism, bilingualism positively affects creativity. In addition, the effect of bilingualism on different domains of creativity is different. |
| Eggers, Lovelace, and Kraft (2017) | Whether critical thinking leads to increased creativity, which in turn leads to improved business performance. | 75 undergraduate business students comprised of 26 teams who completed a semester-long web-based strategy simulation. | Critical thinking increases creativity and creativity mediates the positive relationship between critical thinking and business performance. |

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| Mannucci and Yong (2018) | How the effect of knowledge depth and breadth on creativity varies over the career age? | 2070 creators involved in 231 animated movies produced and released in US during 1978-2013. | Different levels of knowledge depth and breadth facilitate creativity at different ages of an individual's career. Individuals who can appropriately restructure their knowledge base across their career are more creative than individuals who have stable knowledge base. |
| Ko and Butler (2007) | How entrepreneurial creativity occurs? | Interviews conducted with 8 Hong Kong entrepreneurs | Entrepreneurs prior knowledge, education, experience, social networks, and alertness to opportunities allow them to connect dots and facilitates associative and dissociative thinking that foster entrepreneurial creativity. |
| Im, Montoya, and Workman Jr. (2013) | How internal and external team dynamics impact new product (NP) and marketing program (MP) creativity? | Survey of 206 sets of projects managers-team leaders from high-tech manufacturing industries in US | Two dimensions of creativity-novelty and meaningfulness in NP and MP creativity are impacted differently by internal (social cohesion, superordinate identity) and external (market-based reward system, planning process formalization, and encouragement to take risks) team dynamics. |
| Barczak, Lassk and Mulki (2010) | What are the antecedents of team creativity? | Survey of 82 teams comprising 422 responses | Teams' emotional intelligence fosters the development of cognitive and affective trust, which helps to create a collaborative culture that results to higher levels of team creativity. In addition, cognitive trust moderates the effect of collaborative culture on team creativity. |