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Getting ahead and getting along in entrepreneurial networks: network effects of the “dark” and “light” sides of personality in new venture performance

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This dissertation explores how dark and light personality traits influence venture performance via mediating effects of social structure. Because entrepreneurship is an inherently social process, theoretical perspectives of social network theory and social comparison theory are used to examine how entrepreneurs' dark and light personality traits interact with personality traits of socially proximal others to influence venture performance via network structure. These perspectives are drawn together using socioanalytic theory. This dissertation argues that agreeableness and narcissism interact with the personality traits of network others at the group-level to influence structural hole positioning within entrepreneurial networks; in turn, structural holes are hypothesized to exert a positive effect on venture revenue. This study offers contributions to the fields of entrepreneurship, entrepreneurial personality, social networks, and social comparison processes. Hypotheses are tested using a dataset of 234 entrepreneurs nested within 24 groups; analyses are conducted via linear mixed effects models and Monte-Carlo approximation of mediation confidence intervals (Model 1) and OLS regression and non-parametric bootstrapping approximation of mediation confidence intervals (Model 2).

DEDICATION

This work is dedicated to my husband Joshua Yates, without whose unwavering support this project and degree would have been impossible. I also dedicate this work to my parents, Elizabeth and Robert Antin, who have supported my education, broadly defined, through every stage of my life. Finally, I dedicate this work to my grandfather, James Peters, who taught me to be virtuous, hardworking, and integrous.

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CHAPTER I

INTRODUCTION

Personality in entrepreneurship

Personality can have a significant effect on the cognitions and intentions of entrepreneurs (e.g., Leutner et al., 2014; McLarty, Skorodziyevskiy, & Muldoon, 2021; Seibert, Lumpkin, & Zhao, 2010; Seibert & Zhao, 2006). In addition, entrepreneurs' personality traits may also influence venturing outcomes (Ciavarella et al., 2004). For example, certain personality traits, such as conscientiousness and self-efficacy, have been linked to entrepreneurial behaviors (Rauch & Frese, 2007). In entrepreneurship the role played by other traits, such as emotional stability and openness to experience, is less understood (Brandstätter, 2011; Ciavarella et al., 2004). Despite continued research efforts to establish a clear taxonomy of personality in entrepreneurship, a clearly defined entrepreneurial personality remains elusive. In response, recent research has suggested a more nuanced examination of the role of personality in entrepreneurship (Klotz & Neubaum, 2016; D. Miller, 2015). Specifically, studies have begun to examine dark and light sides of personality traits in efforts to create a thorough theoretical foundation for future research on constructs such as entrepreneurial intentions and orientation (McLarty et al., 2021; Smith et al., 2018). In light of this, interest has grown in the connection between dark triad traits and entrepreneurship (Hmieleski & Lerner, 2016).

In particular, narcissism is frequently connected with entrepreneurship. Because entrepreneurial success is often predicated on building and managing relationships (Hoang &

Antoncic, 2003), conventional logic suggests that narcissists would have a difficult time amassing entrepreneurial successes. Yet, numerous successful entrepreneurs are larger-than-life, highly narcissistic figures, and narcissism appears rampant among entrepreneurs. In fact, anecdotal evidence seems to indicate an entrepreneurial advantage in narcissism (D. Miller, 2015). Despite entrepreneurship accounting for a significant portion of economic development (Castano et al., 2016; Galindo & Mendez, 2014; Hall et al., 2010) and entrepreneurial personalities capturing the zeitgeist's imagination, the question of if and how narcissists are more adept at building entrepreneurial success remains unanswered. Although limited research has explored a link between the relational effects of narcissism and entrepreneurship (Smith & Webster, 2018), these results have focused on entrepreneurial antecedents or externalities and are not clearly linked to positive outcomes. Yet, contrary to established knowledge from the organizational behavior field (Rosenthal & Pittinsky, 2006), high co-occurrences of narcissism and entrepreneurship ostensibly suggest a narcissistic advantage.

At the same time, very limited entrepreneurship research has examined more prosocial personality traits. In particular, the entrepreneurship research examining agreeableness is extremely limited. Characterized by altruism, emotional support, caring for others, and nurturing behaviors (Digman, 1990), the agreeableness trait captures many prosocial behaviors that are antithetical to those associated with narcissism. Agreeableness is not commonly associated with entrepreneurship (Seibert & Zhao, 2006), and there is no meta-analytic evidence of a positive significant relationship between agreeableness and entrepreneurial antecedents or outcomes (Seibert et al., 2010). However, potential negative relationships among agreeableness and venture performance or survival remain unknown. In light of the known relational aspects of entrepreneurship (Brüderl & Preisendörfer, 1998; Dubini & Aldrich, 1991; Hansen, 1995), it is

likely that interpersonal behaviors associated with agreeableness are likely to influence entrepreneurial relationships or social processes.

These research streams highlight the need to re-examine the effects of dark and light personality traits in entrepreneurship. Due to the inherently social nature of entrepreneurship (Dubini & Aldrich, 1991), socially-influenced perspectives are likely to be especially salient. Building on research exploring the complexity of entrepreneurial personality traits (Klotz & Neubaum, 2016) and the social intricacies of entrepreneurship, this dissertation seeks to examine the effects of dark and light side personality traits in entrepreneurship by probing underlying mediating relational factors linking narcissism and agreeableness to entrepreneurial success. In doing so, I seek to enhance the understanding of trait narcissism in entrepreneurship by uncovering social structures underpinning contexts in which entrepreneurs benefit from high trait narcissism, frequently associated with negative relational outcomes. This research also aims to enhance the understanding of agreeableness, commonly associated with positive relationships, by examining how similar social structures can underpin contexts in which entrepreneurs experience limited venture success. The theory developed in this dissertation therefore seeks provide evidence for a more complex view of the influence of personality in entrepreneurial processes as well as contribute significant theoretical richness to the narcissism and agreeableness constructs.

Social influences on performance

Due to the inherent social processes underlying entrepreneurship**,** this dissertation examines the effects of narcissism and agreeableness via a social network perspective, which build on the central proposition that individuals' behaviors, attitudes, and perceptions are influenced by those around them. In doing so I suggest that relational habits of narcissistic and agreeable entrepreneurs facilitate and impede strategically advantageous network positions

known as structural holes (Burt, 1992). Entrepreneurship research has well established that social structures exert significant influence onto entrepreneurs (Brüderl & Preisendörfer, 1998; Dubini & Aldrich, 1991; Hansen, 1995; Penney et al., 2019; Vardaman et al., 2021). Entrepreneurs rely heavily on social networks during entrepreneurship (Hoang & Antoncic, 2003; Hoang & Yi, 2015; Slotte-Kock & Coviello, 2010), and networks are theorized to provide critical access to social capital and resources. Extant research generally views the effect of social relationships on entrepreneurship to be positive, and limited research has examined how networks may negatively affect entrepreneurship (Burt, 2019a; Gargiulo & Benassi, 2003; Weber & Weber, 2011).

In order to explore this area, I examine how the structure and composition of the social relationships within an entrepreneur's network can have both positive and negative influences on performance. In doing so, the theory of structural holes (Burt, 1992) and social comparison theory (Davis, 1966; Festinger, 1954; Wood, 1989) are incorporated. Prior network entrepreneurship research has found that structural holes can enhance opportunity identification (Ferriani et al., 2009) and are related to entrepreneurial success (Burt, 2019b), suggesting that entrepreneurs who occupy network structural holes may experience an advantage in venturing. Structural hole positions are predicated by strategic social behaviors and activities (Burt, 1992), suggesting that some individuals may be more apt to attain them than others. Confluently, social comparison theory suggests that individuals take cues on appropriate behaviors and activities from proximal others, suggesting that entrepreneurs may examine the strategic behaviors of network others in determining how to behave in their own social interactions. Thus, the theoretical arguments in this dissertation suggest that venture performance will depend on both an individual's propensity to occupy structural holes as well as this strategic propensity of other network actors.

Insights from socioanalytic theory

These perspectives are drawn together using socioanalytic theory (Hogan, 2007; Hogan et al., 1985). Socioanalytic theory suggests that individuals rely on twin motivations for positive relationships and competitive achievement, or *getting along* and *getting ahead* (Blickle et al., 2010, 2011; Hogan & Shelton, 1998) to attain upward movement in a universal social hierarchy underlying all aspects of social life and interactions. Built on anthropological perspectives of human behaviors within groups, socioanalytic theory suggests that getting along and getting ahead are primal human needs and that all individuals are tasked with balancing these two classes of behaviors to attain social control, status, and popularity. Although all individuals seek to balance getting ahead and getting along, some may be more adept at doing so than others. In order to make up for potential interpersonal deficiencies in getting along, individuals may rely on learned social strategies to enhance getting ahead as an alternative means of gaining social status. Thus, socioanalytic theory suggests that a) individuals seek social power and acceptance, b) this can be attained via getting ahead and getting along behaviors, and c) some individuals are more likely than others to adeptly utilize these behaviors to gain upward movement in the status hierarchy. Because the status hierarchy is constructed through repeated social interactions, these processes are also likely to be influenced by the getting along and getting ahead behaviors of socially proximal others.

This dissertation employs socioanalytic theory as its central theoretical perspective. In doing so, I propose that entrepreneurs who are more likely to get ahead will be more likely to move into structural hole positions; in turn, structural hole positions will increase the likelihood of venture success. In contrast, entrepreneurs who rely on getting along behaviors to attain social status are less likely to occupy network structural holes and, as a result, will not be as likely to

experience the associated increase in venture success. Because socioanalytic theory suggests that getting ahead and getting along behaviors are catalyzed via social interactions, I further suggest that these proposed mechanisms will be influenced by social comparison processes. Therefore, this research argues that the extent to which an entrepreneur's network is composed of others who are more adept in getting ahead or getting along will also influence structural hole occupancy. Specifically, getting ahead-focused entrepreneurs embedded in high getting ahead networks will be more likely to experience a greater venture advantage; conversely, getting along-focused entrepreneurs embedded in high getting along networks will be more likely to experience a greater disadvantage.

Research questions

This dissertation focuses on how dark and light personality traits among entrepreneurs can impact venture performance via the effects of their social interactions. It specifically explores how entrepreneurs' personality traits interact with social structure and composition to influence venture revenue. The questions to be addressed include: (1) How do dark and light personality traits influence venture performance? (2) How do dark and light personality traits influence the entrepreneur's network positioning? (3) To what extent does network structure mediate the effect of personality traits onto venture performance? (4) To what extent is an entrepreneur's success in entrepreneurship influenced by composition of the network in which they are embedded? Because recent research has indicated unique effects of dark and light traits in entrepreneurship, these questions are of particular interest to the developing notion of the entrepreneurial personality. Furthermore, these questions contribute to a developing body of research on the potential negative effects of networks in entrepreneurial processes.

Study objectives and contributions

The specific objectives of this dissertation are to (1) examine how dark and light personality traits influence venture performance via social interactions; (2) contribute to knowledge of how specific network structures facilitate entrepreneurship; (3) explore how the composition of an entrepreneur's network affects entrepreneurial success; and (4) investigate the potential negative effects of social networks in entrepreneurship.

This study adds conceptually to the research on entrepreneurial personality by expanding the concept to include knowledge of dark and light traits in a theoretically complex manner (Klotz & Neubaum, 2016; D. Miller, 2015). The results herein differentiate the effects of narcissism and agreeableness in entrepreneurship from those in organizational settings. In doing so, I enhance knowledge of trait narcissism and agreeableness by uncovering social structures underpinning contexts in which narcissistic individuals reap benefit despite a normative negative relational association and agreeable individuals reap disadvantage. While previous research has focused on connecting dark traits to entrepreneurial antecedents such as innovation and adaptability (Smith & Webster, 2018), risk-taking, general self-efficacy, and entrepreneurial intentions (Mathieu & St-Jean, 2013), I focus instead on structural mechanisms relating dark and light traits to a performance-based outcome.

This dissertation also contributes to understanding of social networks in entrepreneurship. Social networks are critical to success in entrepreneurship (Dubini & Aldrich, 1991; Greve & Salaff, 2003; Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010), and many studies have focused on the benefits that social networks offer to entrepreneurs and new ventures (e.g., Hallen & Eisenhardt, 2012; Klyver et al., 2008; Leyden et al., 2014). Despite ongoing development in this body of literature, gaps continue to exist. First, there is limited extant research on specific

network structures that contribute to entrepreneurial success. Second, there is a need for increased research into the interactions among specific network structures and other psychometric predictors of entrepreneurial performance (e.g., Ho & Pollack, 2014). Third, very limited studies examine the "dark side" of networks in entrepreneurship (e.g., Burt, 2019a; Weber & Weber, 2011), and there is a need for increased understanding on ways in which entrepreneurs may experience a performance disadvantage through network structure or composition which may limit their access to resources and social capital. This dissertation seeks to fill these gaps by exploring how network structure mediates the relationship of personality traits onto venture revenue, by examining how the personality traits of network-embedded others can influence the network structure of individual entrepreneurs, and by examining how a specific network characteristic can contribute to venture performance.

Model overview

The conceptual model is shown in Figure 1. First, narcissism and agreeableness are proposed to influence structural holes. Next, the moderating effects of group-level narcissism and agreeableness are proposed to influence the relationships of narcissism and agreeableness onto structural holes such that a) the effect of narcissism onto structural holes will be strengthened by groups high in narcissism, and b) the effect of agreeableness onto structural holes will be strengthened by groups high in agreeableness. Third, structural holes are proposed to influence venture revenue. Finally, individual-level narcissism and agreeableness are proposed to indirectly influence venture revenue via the mediating effect of structural holes.

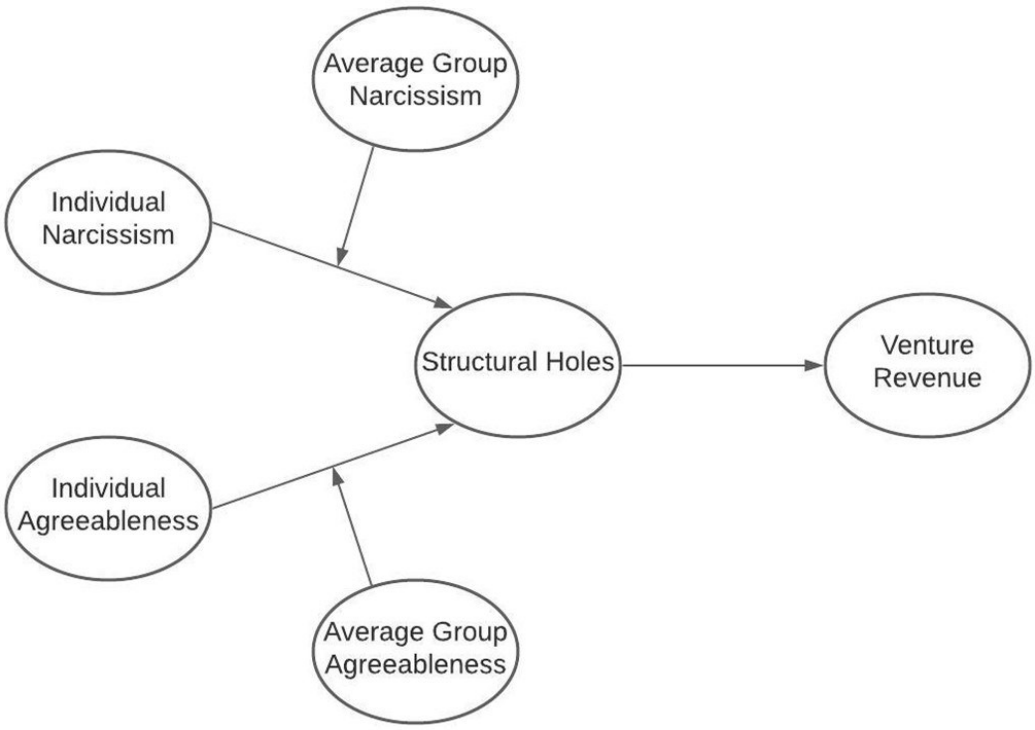

Figure 1.1 Conceptual Model

CHAPTER II

LITERATURE REVIEW AND THEORETICAL BACKGROUND

Literature review

In order to explain this model, I review the relevant literature on four major topics of entrepreneurial personality, socioanalytic theory, social network theory, and social comparison theory. In addition, literature on sub-topics including narcissistic traits, agreeableness, the theory of structural holes, the proxy model of social comparison, and frog pond models is also reviewed.

Personality in entrepreneurship

Although early research into relationships among personality and entrepreneurship was characterized by atheoretical narratives and unreliable empirical results (Klotz & Neubaum, 2016; Leutner et al., 2014; Seibert et al., 2010), this field of research has experienced a modern resurgence in interest. Driven by increased reliability of the five-factor model of personality (Costa & McCrae, 1992; Digman, 1990) and the emergence of meta-analytic methods, entrepreneurship research has explored the relationships among personality traits and indicators of entrepreneurship in efforts to further theoretical development of bodies of research such as entrepreneurial intentions (e.g., Seibert et al., 2005), opportunity recognition (e.g., Ardichvili et al., 2003), and new venture survival (e.g., Ciavarella et al., 2004). In part, this research has grown out of Schneider's (1987) attraction-selection-attrition (ASA) model, which suggests that personality differences exist across organizations and work environments. For example, Zhao

and Seibert (2006) use the ASA as the theoretical foundation for a meta-analysis on the Big Five dimensions and entrepreneurial status, finding that entrepreneurs exhibited higher conscientiousness and openness to experience and lower neuroticism and agreeableness than managers.

Despite a plethora of meta-analyses on the subject (e.g., Brandstätter, 2011; Rauch & Frese, 2007; Seibert et al., 2010), relationships among personality traits and entrepreneurship have been difficult to reconcile due to the varied definitions and measurements of entrepreneurship and a wide array of personality traits. For example, internal locus of control and need for achievement are both positively related to venture growth (Lee & Tsang, 2001) while need for achievement, generalized self-efficacy, need for autonomy, innovativeness, and proactive personality are positively related to entrepreneurial behavior (i.e., business creation and success; Rauch & Frese, 2007). In addition, four of the Big Five personality traits – conscientiousness, openness to experience, emotional stability, and extroversion – predict entrepreneurial intentions and performance (Seibert et al., 2010). Recently, research has begun to examine the effects of more narrowly defined personality traits (e.g., innovativeness, risk-taking) on a wider variety of entrepreneurial outcomes (e.g., charitable organization founding, event planning; Leutner et al., 2014), creating an even wider array of observed relationships. The result has been an increasingly broader body of knowledge with limited coherence (Klotz & Neubaum, 2016).

In light of these developments, novel approaches to entrepreneurial personality have examined multifaceted personality traits. Specifically, Klotz and Neubaum (2016) proposed that dark sides of positive traits (e.g., excessive control as an aspect of conscientiousness) and light sides of dark traits (e.g., ambition as an aspect of narcissism) are likely to interact with

contextual moderators to influence the relationship among personality traits and entrepreneurial outcomes. Generalized findings indicate a link between dark triad traits – comprised of narcissism, psychopathy, and Machiavellianism – and entrepreneurial intentions (Brownell et al., 2021; Do & Dadvari, 2017; Mclarty et al., 2021; Wu et al., 2019) as well as potential negative effects on venturing resulting from very high levels of bright traits (Smith et al., 2018). For example, Baron, Mueller, and Wolfe (2016) find a negative relationship between high levels of self-efficacy in entrepreneurs and firm performance. Despite this initial research, studies examining dark sides of conventionally "positive" relational traits and light sides of conventionally "negative" relational traits in entrepreneurship remain limited.

Narcissism

This study focuses on the examination of subclinical, social-personality conceptualizations of narcissistic traits (Carlson et al., 2011; J. Miller & Campbell, 2008). The contextual reinforcement model of narcissism (Campbell & Campbell, 2009) suggests that individuals high in trait narcissism are likely to experience positive outcomes in *emerging zones*, periods of relationships or activities marked by newness, limited information, uncertainty, and short-term contexts. This model further indicates that narcissists are likely to excel in decision-making under uncertainty and that novelty and information asymmetry can create a heightened short-term positive social perception of narcissistic individuals. Limited research into entrepreneurial contexts supports this view. For example, theoretical work suggests that narcissists excel in garnering stakeholder support from key funding sources in early-stage ventures (Wiklund et al., 2018). Similarly, Grijalva and Harms (2014) theorize that narcissistic grandiosity and overconfidence of may be positively linked to repeat entrepreneurship, but that these effects may limit entrepreneurial learning, thereby diminishing future venture success.

Narcissism has been empirically linked to entrepreneurship as well. Mathieu and St. Jean (2013) find that entrepreneurs are higher in narcissism measures than both employees and managers and that narcissism is linked to common entrepreneurial personality traits of locus of control, general self-efficacy, and risk propensity as well as innovation and adaptability (Smith & Webster, 2018). Similarly, traits such as high ambition and overconfidence may inspire followers to gather behind a grand vision of the narcissistic entrepreneur during nascent entrepreneurship (Wiklund et al., 2018). Moreover, narcissism is positively related to entrepreneurial intentions; yet, narcissistic entrepreneurs are more likely to appropriate, rather than create, value via new ventures (Do & Dadvari, 2017; Hmieleski & Lerner, 2016). While the results of these limited findings suggest positive benefits in entrepreneurship through narcissism, they ultimately fail to address entrepreneurial performance outcomes and relationships remain murky and uncertain. Moreover, the influences of mediating relational processes linking narcissism to venture outcomes have been largely unexplored.

Agreeableness

Entrepreneurship research into certain light side traits is also limited. As one of the Big Five personality traits, agreeableness is characterized by "the more humane aspects of humanity" (Digman, 1990, p. 422), including characteristics such as altruism, emotional support, caring for others, and nurturing. Attributes commonly associated with agreeableness include friendliness, flexibility, cooperation, courtesy, and easy-goingness (Barrick & Mount, 1991). Studies examining the relationship between agreeableness and entrepreneurship are extremely limited, and extant work is limited to research on the relationship of Big Five traits to venturing indicators and outcomes. Via a meta-analysis, Zhao and Seibert (2006) found entrepreneurs lower on agreeableness than managers. Results of one study indicated a positive relationship

between agreeableness and invention-related aspects of entrepreneurship (Leutner et al., 2014). Despite this, studies show no significant relationship between agreeableness and entrepreneurial intentions or venture performance or survival (Ciavarella et al., 2004; Mclarty et al., 2021; Seibert et al., 2010).

Socioanalytic theory

Socioanalytic theory (Hogan, 1996, 2007; Hogan et al., 1985; Hogan & Shelton, 1998) builds on anthropological perspectives of group behavior and seeks to explain how individual personality and behavior is driven by essential, human motives. The theory assumes that humans are inherently social beings, noting three inherent motives of human nature. The first motive is a need for social interaction and acceptance, termed "getting along." The second motive is a need for status and achievement within groups, termed "getting ahead." The third motive is noted as being the search for meaning. The theory proposes that social interactions are expressed via either getting ahead or getting along, suggesting that these motives are particularly important in predicting social behaviors in groups (Hogan & Blickle, 2018).

Although all humans are motived by these three core needs, individual differences indicate that some will be driven by certain motivations more than others. Individuals engage in getting ahead and getting along via social interactions. In turn, repeated social interactions build towards the construction of a naturally occurring social hierarchy. Individuals acquire beneficial or detrimental positions in the social hierarchy through getting ahead and getting along; although these two behavior classes achieve different ends, both can lead to desirable positions in the social hierarchy. Despite this, getting ahead and getting along are often diametrically opposed. Status achievement is likely to produce resentment from others; at the same time, social acceptance and popularity commonly lead to social acquiescence, limiting status attainment

(Hogan et al., 1985; Hogan & Blickle, 2018). Thus, individuals must often choose between getting ahead and getting along as a means of attaining a desirable place in social hierarchies. Moreover, individuals will differ in their ability to attain desired ends through social interactions, whether those goals be focused in getting ahead or getting along. Aptitude in getting ahead and getting along via social interactions is a function of individual differences (i.e., personality) and social strategies. To an extent, an individual can overcome biological interpersonal deficiencies by acquiring strong social strategies (Hogan et al., 1985; Hogan & Shelton, 1998). The success of enacting social strategies to achieve desirable positioning in the social hierarchy is largely dependent on individual adaptability and drive.

Finally, socioanalytic theory suggests that personality is dual-faceted, and can be conceptualized according to both identity- and reputation-based views (Hogan 2007). The identity view of personality is based in individual's self-concepts, including their feelings concerning their own motivations, beliefs, and behaviors (McAdams, 1993). The reputation-based view of personality is based in observers' perceptions and understanding of the individual based on previous interactions. Thus, reputation-based personality is formed on the basis of others' perceptions of identity-driven behaviors, motivations, and actions. This dissertation examines personality via the identity perspective.

In summary, socioanalytic theory explains how individual behavior is dictated by a social status hierarchy determining social acceptance, support, power, and order. Socioanalytic theory maintains that status hierarchy is navigated through getting along and getting ahead*,* which are "the two great problems in life that each person must solve" (Hogan et al., 1985, p. 178). Getting along behaviors are driven by socialization needs, including desires for attention, positive social feedback, and close relationships. Getting ahead behaviors are motivated by competition for

status. Individuals' power and social status emerge through repeated interactions comprised of these two classes of behaviors. Individual proclivities toward ability and desire to get along and get ahead are dually based: in personality and social strategies. Personality varies with temperament according to individual feelings of affect and emotional constraint; while social strategies vary by habitual behaviors and adaptability (Hogan & Shelton, 1998). An inherent tension exists between getting along and getting ahead. Behaviors that beget power and status do so at the expense of perceptions of likeability; while behaviors that increase perceptions of likeability commonly limit power acquisition (Hogan, 1996). As a result, individuals may experience internal struggle in balancing getting along and getting ahead to achieve social success and desired ends.

Social network theory

Network theory is underpinned by the concept that individuals, groups, and firms exist within an interconnected web of social relationships. The pattern of this web of relationships forms the structure of the social network. In turn, this structure becomes a lens through which these entities experience the world around them. In this manner social networks shape how individuals, groups, and firms experience the world, interpret these experience, inform decision-making behavior, and attain resources (Salancik, 1995). Social relationships, known as ties, are conceptualized through two different models: the bond model, in which ties are seen as relatively stable, unchanging social states (e.g., kinship, friendship), and the flow model, in which social ties are understood as information and resources passed from actor to actor (Borgatti & Halgin, 2011). Thus, social networks are conceptualized as nodes, representing individuals, groups, or firms dependent upon the level of analysis, and ties, representing both transient and ensuring relational states among these entities. Social networks can be depicted as web-like images (see

Figure 2), and they can be quantified and empirically analyzed via matrices of either dichotomous or valued data (see Figure 3).

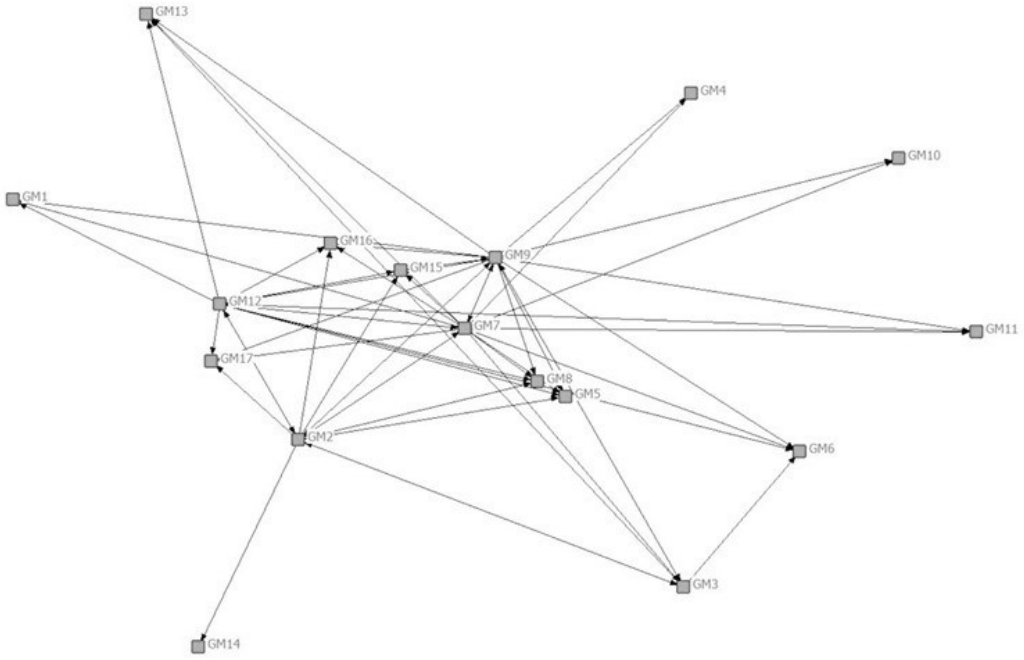

Figure 2.1 Visual image representation of a social network

Gray squares represent individual members of a 16-member group. Lines drawn between squares represent the existence of a friendship relationship. Arrows represent the directionality of the relationship, i.e., the arrow pointing from GM3 to GM6 indicates that GM3 considers GM6 to be a friend, but that GM6 does not consider GM3 to be a friend.

	GM 1	GM 2	GM 3	GM 4	GM 5	GM 6	GM 7	GM 8	GM 9	GM 10	GM 11	GM 13	GM 14	GM 15	GM 16
GM1															
GM2			2			2	1						1		6
GM3				1						1					1
GM4						1	3		2		2		1	1	
GM5	1		1			1		1						1	
GM6	1	2	2	1		9	4			1		3		1	8
GM7	1		1	1								1			
GM8			1							1		4			4
GM9				1	1	1									
GM10	3		1	2		1		3	1					2	1
GM11	2	2	1	2	5			1		1		1			
GM13	1	1			2		2							4	2
GM14					1		1					1			
GM15		1	2												
GM16	1	1						1		1		3			

Figure 2.2 Quantitative matrix representation of valued network data

Each column and row represents individual members of a 16-member referral network. The matrix is read from left to right. For example, GM6 gave GM16 8 referrals, but GM16 did not provide GM6 with any referrals.

A number of perspectives have been developed to explain how mechanisms and processes interact with network structure, content, and governance to shape the experience of network-embedded individuals (Hoang & Antoncic, 2003). For example, the theory of the strength of weak ties (Granovetter, 1973) theorizes a direct relationship between the amount of overlap of two actors' networks and the strength of the social tie between them; thus, this theory points to the importance of weak ties as important sources of novel information and resources from distal network subgroups. Similarly, the theory of structural holes (Burt, 1992) explains the importance of brokerage power roles in networks, which occur when network actors connect what would otherwise be two, disparate network groups.

In organizational research, social capital is understood as social resources embedded in networks that offer competitive advantage to individuals, groups, and firms (Lin, 1999; Nahapiet & Goshal, 1998), suggesting that network social capital is a critical antecedent to competitive advantage and individual success. Network structure determines the degree to which embedded entities can access social capital. For example, Coleman (1988) theorizes that social capital results from dense, cohesive networks via the social norms, mutual obligations and dependencies, and trust inherent in this structure. Other perspectives (Granovetter, 1973) suggest that social capital is best fostered through networks that have many weak ties. A third theoretical reconciliation of these viewpoints suggests that social capital is accessed via a somewhat fragmented structure, but actors can best leverage social capital into competitive advantage via cohesive, dense, and closed structures (Burt, 2000).

In entrepreneurship research, social networks are theorized to provide critical advantages to individual entrepreneurs (Greve & Salaff, 2003). Social networks perspectives have been implemented in entrepreneurship to explain and predict topics such as entrepreneurial passion (Ho & Pollack, 2014), innovation (Schott & Sedaghat, 2014), investment partners (Hallen & Eisenhardt, 2012), and opportunity discovery (Shu et al., 2018). Although debates exist surrounding circumstances under which networks may serve to disadvantage entrepreneurs (Burt, 2019a), this body of research has generally indicated that networks are vital resources in entrepreneurship. Entrepreneurs rely heavily on network ties to attain resources, acquire novel information, and secure financing (Slotte-Kock & Coviello, 2010). In addition, networks can be vital sources of affective support (Arregle et al., 2015; Edelman et al., 2016), and support from both close and distant network ties has been related to new venture survival (Brüderl & Preisendörfer, 1998). However, it is likely that benefits drawn from entrepreneurial networks

may vary according to characteristics of individual entrepreneurs. For example, interactions with close network ties have been found to increase or decrease the likelihood of venture launch dependent upon the entrepreneur's social skills (Klyver & Arenius, 2020). Due to its conceptual foundations in social strategy and competition, the theory of structural holes (Burt, 1992) is an especially salient network perspective in empirical social network entrepreneurship research (e.g., Burt, 2019a, 2019b; Ferriani et al., 2009).

Theory of structural holes

Structural holes are network configurations resulting from an absence of ties among distal groups; individuals who occupy network structural holes have non-redundant social connections (Burt, 1992, p. 4), gaining access to varied sources of social capital. For example, Figure 4 depicts individual "A" who is occupying a structural hole connecting groups 1-3. Structural holes provide strategic advantages, and they can be especially beneficial for individuals operating within a competitive arena. The network theory of structural holes suggests that competitive social processes, such as entrepreneurship, are underpinned by social negotiations for resources and information. The ability to occupy structural holes "determine[s] the extent and nature of a player's competitive advantage in that negotiation" (Burt, 1992, p. 6). Hence, structural holes provide access to network social capital by enhancing individuals' abilities to control relational terms, assert power over network others, and increase control over information and resource flows.

Broadly, structural holes provide individuals increased access to network social capital, thereby facilitating a competitive advantage. Specifically, structural holes provide competitive advantage to individuals in two ways, via 1) information and 2) control. Informational benefits come in three forms (Burt, 1992, 2007). First, due to their unique structural attributes, structural

holes increase the individual's access to information as it passes through the network. Second, individuals who occupy structural holes receive information passing through the network earlier than competitors, meaning that structural holes often lead to a "first-mover" advantage. Third, structural holes filter information as it passes through the network; information received in structural hole positions has been legitimized and concentrated via network transmission when it reaches structural hole occupants.

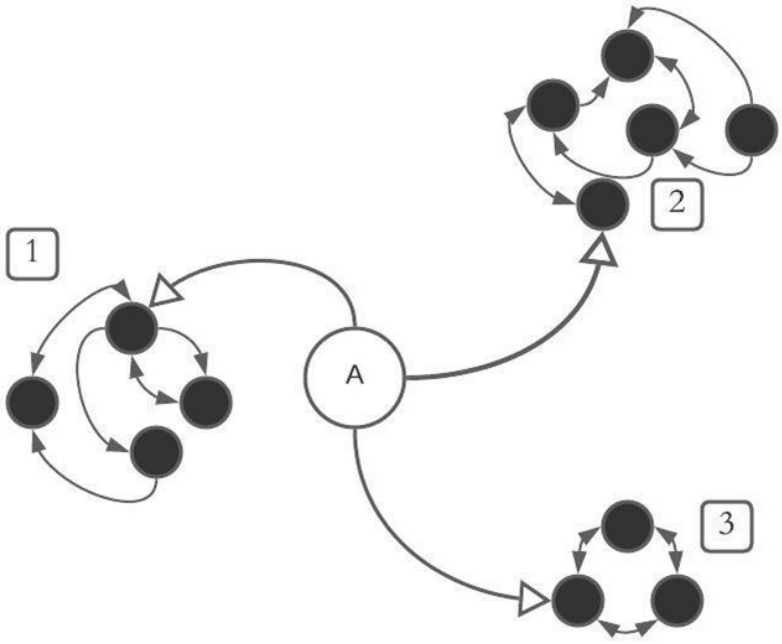

Figure 2.3 Visual Depiction of Structural Holes in a Network

Circles Represent an individual actor, or node; lines represent ties, or social relationships, between actors. In this depiction, actor "A" is occupying a structural hole between network clusters 1-3.

Control benefits take the form of *tertius gaudens* (Simmel, 1950, 1955), meaning the "rejoicing third," in which an individual benefits from the relationship between two others. These benefits arise via information control. Individuals occupying structural holes are able to strategically disseminate information and resources to distal network groups. These control benefits also allow individuals to strategically create social connections from distal individuals. Essentially, individuals who occupy structural holes benefit from brokerage roles that enhance their ability to negotiate for network resources and social capital (Burt, 2007; Soda et al., 2018). In summary, structural holes grant individuals strategic advantage in competitive arenas. Individuals who occupy many structural holes experience higher rates of return on investments of human, social, and financial capital. Structural holes grant individuals greater knowledge of and control over profitable opportunities. Furthermore, these information and control benefits are compounding; for example, individuals can leverage information benefits gained via one relationship to heighten their negotiating position in another (Burt, 1992).

Social comparison theory

Social comparison theory (Festinger, 1954) suggests that individuals' self-evaluations of their opinions, skills, and abilities are determined by objective standing as well as standing in relation to referent others to which they compare themselves (Bassis, 1977). The theory suggests that information gleaned through self-comparisons with others is an important source of individual self-knowledge. These comparisons are made in reference to a group of others either a) similar on certain attributes or b) proximal to the focal individual. Aspirations and self-knowledge can vary greatly depending on the relative attributes of those in the reference group. Social comparisons are especially useful in evaluation of attributes that are subjective in nature and when objective ratings are difficult to attain (Wheeler et al., 2002).

Social comparisons can be deliberately carried out to evaluate one's group standing and to create enhancement of the self-concept (Helgeson & Mickelson, 1995). Comparisons with similar or proximal others provide information on the capacity of skills, abilities, opinions, and performance. Upward or downward comparisons are also carried out in order to elicit positive socio-emotional responses from the individual; for example, an individual can bolster their self-esteem by comparing themselves to someone else who is in a worse position. However, the social environment also plays a role in the way that comparisons shape self-evaluations (Wood, 1989). Research shows that the social environment in which the individual is embedded may impose social comparisons and that these unconscious comparisons have similar affects to deliberate comparisons (e.g., McGuire & Padawer-Singer, 1976; Morse & Gergen, 1970). For example, individual satisfaction with outcomes or performance is less related to objective outcomes and more related to outcome expectations that are salient in the social environment (Messé & Watts, 1983). Thus, it is likely that social comparisons are made subconsciously and automatically, as an inherent part of social interactions (Brickman & Berman, 1971; Wood, 1989).

Although scholars have acknowledged the potential value that social comparison theory can contribute to the entrepreneurship field, there is limited extant research examining entrepreneurship through the lens of social comparisons (Shaver, 2010). At the firm level, research shows that the average size of established regional firms positively influences the size of new entrants, suggesting that existing firms act as the referent group to which entrepreneurs make decisions regarding firm structure and form (Carr et al., 2021; Martin-Sanchez et al., 2018). Meanwhile, at the individual level, it has been shown that upward social comparison mechanisms limit the extent to which parental entrepreneurial performance enhances offspring's

perceptions of desirability and feasibility of a career in entrepreneurship (Criaco et al., 2017). Thus, although limited in number, social comparison processes are likely to influence psychological and operational processes underlying venture startup and establishment. In particular, conceptual application of the proxy comparison model and empirical testing of frog pond models are likely to offer meaningful contributions to the entrepreneurship field.

The proxy comparison model

The proxy model (Wheeler et al., 1997) builds on Festinger's (1954) original conceptualization of social comparison theory to better explain how social comparisons are used in self-evaluations of ability. The model suggests that individuals are likely to utilize social comparisons to predict their own performance under circumstances when tasks are ambiguous or novel and failure is costly (Martin, 2000). In order to do so, they form a comparison between themselves and a *proxy* other who has already completed the task who is well-equipped to complete the task. These comparisons may rely on comparisons of related attributes (Goethals & Darley, 1977) that are likely to facilitate performance on the focal task rather than on performance, itself. For example, when assessing their ability to successfully climb a peak, a hiker may compare themselves to other climbers based on physique or acquired equipment rather than on past climbing success (Martin, 2000). Thus, the proxy model implies that individuals may rely on comparisons of related attributes to assess likelihood of their own future performance when their own and others' performance information is unavailable or ambiguous.

Frog pond models

Frog pond models are designed to assess an individual's rating on a specific attribute in relation to others in the same group (Bassis, 1977; Davis, 1966). These models emphasize an

individual's comparative position within their group (Bliese & Jex, 2002; Vardaman et al., 2016). By conceptually capturing the group average of focal attributes, frog pond models explain how individuals perceive their standing within their referent group and how these comparison perceptions influence outcomes of interest. In this manner frog pond models are particularly useful in assessing how individual outcomes and behaviors are likely to vary dependently on group dynamics and characteristics. For example, "depending upon the size of the pond, the very same frog may be small (if the pond is large) or large (if the pond is small)" (Klein et al., 1994, p. 201). Thus, frog pond models suggest that group members vary on a certain attribute and that the composition of the group entity is, itself, a meaningful influence on the outcomes of that variation.

Implicit social evaluations

While frog pond models indicate a purposeful direct comparison of one's skills and abilities against the skills and abilities of a group of referent others, the social comparison literature suggests that comparisons may also take an implicit, unconscious form. Wood (1989, p. 233) argues that individuals are likely to engage in rapid comparisons as an intrinsic element of social interaction, stating that "such [involuntary] comparisons may affect one's self-evaluation, even though one has not selected them." For example, upon observing a flashy, high-end vehicle driving by, one may implicitly ask themselves, "Is the owner of that vehicle really happier than I am?" Empirical results support the existence of these implicit evaluations against others and their influence on the self-concept. For example, via an experimental design, Morse and Gergen (1970) found that the presence of a very well-dressed individual in a job interview waiting area had a significant negative effect on the self-esteem of participating job applicants; conversely, self-esteem was positively affected by the presence of an unkempt individual in the

same room. This line of research on implicit social evaluations suggests that individuals are likely to draw comparison information from the social context subconsciously and, without the intention to do so. Despite this, these evaluations against the social context continue to have a substantial effect on individuals' appraisals of their skills, abilities, characteristics, behaviors, and outcomes (Wood, 1989).

Venture revenue

Entrepreneurship contributes significantly to global, national, and local economic development (Acs & Szerb, 2007; Castano et al., 2016; Galindo & Mendez, 2014; Schumpeter, 1934). Moreover, the financial gains made through entrepreneurship may aid in the alleviations of poverty in rural, isolated, and economically depressed areas throughout the Unites States (Ring et al., 2010). In addition, extant research supports a sizable link between entrepreneurial activity and individual well-being (Wiklund et al., 2019). For example, individuals who exit the workforce in favor of self-employment and small-business ownership experience an increase in both physical and mental health and overall quality of life (Kautonen et al., 2017; Nikolova, 2019). Furthermore, entrepreneurship continues to serve as an important pathway to financial equality and independence for women and disenfranchised minorities (Heilman & Chen, 2003; Klyver et al., 2011). Although financial gains are not the only indicator of entrepreneurial success for individuals (Carter, 2011), individual entrepreneurs, no doubt, hope to see considerable financial gains through their startup activities. Moreover, recent research finds that the effect of active engagement in entrepreneurship onto feelings of well-being is partially mediated by feelings of autonomy (Shir et al., 2019), suggesting that the individual gains in psychological satisfaction reaped through entrepreneurial activity may be linked to financial

independence and stability. Thus, venture revenue serves as an important indicator of both personal entrepreneurial success as well as global economic development.

Summary

Although research on the ideal entrepreneurial personality has been largely unproductive, scholars acknowledge that certain personality traits are more likely to facilitate entrepreneurship than others. However, limited knowledge exists concerning how contextual social and psychological factors affect these relationships. The suggestion that certain traits facilitate entrepreneurship more so than others comports with socioanalytic theory, which suggests that individuals struggle to balance getting along and getting ahead behaviors and that the extent to which individuals can get along and get ahead depend on both inherent traits and social strategies. Getting ahead and getting along behaviors are played out and reinforced through repeated social interaction. In light of this, social network theory offers a unique perspective from which to examine the intersection of entrepreneurial personality traits, group social interactions, and venture performance. Below, I theorize that unique structural hole network positions serve as a conduit to explain the "getting ahead" and "getting along" performance outcomes associated with certain personality traits. Specifically, I examine narcissism and agreeableness, which conceptually align with the focal "getting ahead" and "getting along" aspects of socioanalytic theory. Furthermore, these traits represent extremes of "dark" and "light" personality and therefore may offer insight into how the spectrum of personality influences entrepreneurship through social processes. In line with social comparison theory, I further argue that individual getting ahead and getting along behaviors are influenced by not only the personality traits of the focal individual, but also those of proximal referent others. In doing so, I suggest that personality's effect on venture performance is mediated by network structures

and that these effects are likely to vary dependent upon the composition of the network within which the entrepreneur is embedded.

Model development

Getting ahead and getting along in entrepreneurial networks

Socioanalytic perspectives on social acceptance and power offer insight into a connection between narcissism and agreeableness and entrepreneurial outcomes. Entrepreneurship necessitates close relationships facilitating access to social capital (Greve & Salaff, 2003; Leyden et al., 2014) as well as control of valuable, imitable resources and financial capital (Barney, 1991; Klyver et al., 2008). Hence, successful entrepreneurs must balance getting along and getting ahead through their interactions to attain both positive relationships and resource control. Due to the unique insight it offers into relational structures, a network perspective offers clarity into the underlying mechanisms through which entrepreneurs high in dark and light traits may balance getting along and getting ahead. Network theory conceptualizes relationships as complex webs of ties among actors (Borgatti & Halgin, 2011; Burt, 1976; Salancik, 1995). Therefore, social power and acceptance are evinced through the unique structural network positions that individual entrepreneurs occupy. Although extant organizational research has focused on the importance of instrumental (i.e., advice) or expressive (i.e., friendship) relationships (Ibarra & Andrews, 1993; Porter et al., 2019; Vardaman et al., 2012), context-specific network conceptualizations can provide insight into new venture outcomes. In particular, referral exchange networks are rich in social capital. Through dyadic referral exchanges, entrepreneurs leverage interpersonal relationships to gain access to social capital in the form of new customer information.

In order to gain access to referral network social capital, successful entrepreneurs must participate in socioanalytic getting along and getting ahead behaviors, maintaining close social relationships and many strategic ties (Aldrich & Zimmer, 1986; Burt, 1992; Lin, 2008). Because entrepreneurship is an inherently social process, entrepreneurs are embedded in networks, thereby gaining access to an array of information and resources (Aldrich & Zimmer, 1986). Embeddedness enables the receipt of information and resource flows passing through the network, and the structure of the entrepreneur's ties affects the speed and efficiency with which entrepreneurs can gain access to as well as the quality of financial capital, information, and resources through all stages of business venturing (Freeman, 1978; Greve & Salaff, 2003). However, access to these advantages depends on entrepreneurs' distinctive network positioning (Hoang & Antoncic, 2003). Hence, entrepreneurs with many strategically advantageous referral network ties can attain greater social capital and customer growth. In turn, these benefits enhance venture viability, growth, and profitability.

In particular, the theory of structural holes (Burt, 1992) suggests that competitive social processes such as entrepreneurship are underpinned by social negotiations for resources and information. These social negotiations result in strategic social tie formations known as structural holes. From a socioanalytic perspective, structural hole occupancy is predicated on getting ahead behaviors; structural hole occupancy indicates control of relational terms, asserting power over network others, and increasing control of information and resource flows. Entrepreneurs attain structural hole occupancy through competition by strategically building unique, non-redundant relationships with valuable others in efforts to gain a powerful social footing (Borgatti & Halgin, 2011; Burt, 1992). Because distal groups of actors are likely to provide unique sources of information, resources (Burt, 2004), and customer referrals, entrepreneurs who occupy many

structural holes gain access to varied sources of social capital. Thus, structural holes are likely to provide a significant competitive advantage to network-embedded entrepreneurs.

Narcissistic entrepreneurs are especially likely to experience upward mobility in the socioanalytic status hierarchy via getting ahead strategies. Hence, due to inherent psychological proclivities towards power attainment (Baumeister & Vohs, 2001), narcissistic entrepreneurs are likely to occupy structural holes. Entrepreneurs can intentionally increase structural holes by undertaking strategic social behaviors (e.g., leveraging relationships, associating with a wide array of network others; Burt, 1992, p. 17), and individuals high in trait narcissism are likely to excel in these strategic social behaviors due to a temperamental predisposition towards power-seeking behaviors. Specifically, narcissistic social apathy (Campbell et al., 2006) and desire for social power (Campbell & Campbell, 2009) suggest narcissistic entrepreneurs will build strategic social connections rather than enduring, close relationships. Power-focused, egocentric ambitions are likely to motivate narcissistic entrepreneurs to form utilitarian relationships with well-connected others, resulting in non-redundant network structures. Thus, narcissistic entrepreneurs will seek out valuable network others as sources of unique social capital and customer referrals due to inherent propensities for fostering strategic, rather than close, relationships. Consequently, they are likely to connect distal social groups, thereby occupying structural holes. In efforts to get ahead and achieve egocentric ends, narcissistic entrepreneurs should build minimally redundant referral networks with high structural hole occupancy.

> ***Hypothesis 1:*** *Narcissism will be positively associated with structural hole occupancy in entrepreneurial networks.*

In contrast, entrepreneurs who rely on getting along strategies in their social interactions are less likely to occupy structural holes. Agreeableness is conceptualized according to characteristics such as “altruism, nurturance, caring, and emotional support” (Digman, 1990, p.

424), suggesting that entrepreneurs high in agreeableness will be focused on relationship building and the well-being of network others. Because agreeableness has been associated with prosocial behaviors (Barrick & Mount, 1991), socioanalytic theory would suggest that entrepreneurs high in agreeableness may be more likely to utilize getting along behaviors over getting ahead behaviors to attain upward movement in the status hierarchy. As a result, these entrepreneurs will approach relationship building benevolently rather than strategically. For example, rather than constructing relationships in efforts to gain access to non-redundant sources of social capital, resources, and referral information, entrepreneurs high in agreeableness are likely to construct relationships based on mutual activities, cooperation, and benefit. Hence, due to their heavy reliance on getting along behaviors, entrepreneurs high in agreeableness are expected to develop cohesive network structures with many redundant ties based on common interests and mutual benefit. As a result, it is unlikely that they will occupy valuable structural holes providing access to referrals.

Limited empirical findings support these expectations. For example, agreeableness has been found to be positively related to job performance in work environments characterized by high levels of cooperative interactions (Witt et al., 2002). Furthermore, facets of agreeableness, such as altruistic behaviors, have been linked to conflict-management tactics characterized by self-sacrifice and group accordance (Komarraju et al., 2003). In group work contexts, agreeableness has been negatively associated with competitive goal setting and behaviors (Graziano et al., 1997). In tandem, these observations suggest that entrepreneurs high in agreeableness will be heavily reliant on getting along behaviors and, as a result, will be less likely to develop non-redundant structural holes.

Hypothesis 2: *Agreeableness will be negatively associated with network structural hole occupancy in entrepreneurial networks.*

Social structure and venture performance

In turn, structural hole occupancy can have tremendously positive effects on venture outcomes, generating entrepreneurial advantage through two mechanisms. First, individuals who occupy structural holes can exploit opportunities to perform brokerage roles, thereby facilitating control of network embedded information and resources (Burt, 2017). Second, structural hole occupancy expedites access to information and resource flows traveling through distal network groups (Burt, 1992). In referral networks, both mechanisms produce competitive advantage for new ventures. Because entrepreneurs occupying structural holes can control referral information flows, these individuals can monopolize customer information to create advantage. Brokerage roles also allow entrepreneurs to strategically leverage customer referrals, negotiating deals for additional critical resources. Furthermore, customer information received by entrepreneurs occupying structural holes is more likely to disseminate from distal network clusters, resulting in highly heterogeneous information (Burt, 2000); as a result, the magnitude and value of received referrals will be greater for structural hole occupants (Hoang & Antoncic, 2003). Through these mechanisms, structural hole theory suggests a positive relationship between the number of structural holes an entrepreneur occupies and startup financial return (Burt, 1992).

Thus, referral network structural hole occupancy facilitates increased customer information, novel resources, and brokerage roles. Collectively these outcomes can have strong positive impact on emergent entrepreneurial ventures. Prior research supports a connection between structural hole occupancy and individual performance. For example, organizational managers who occupy many structural holes are promoted more quickly than less well-connected peers (Burt, 1992, p. 115). Similarly, organizational networks rich in structural holes facilitate

and expedite successful organizational change initiatives (Gargiulo & Benassi, 2003). Although these findings speak to outcomes in the context of established firms, they indicate an advantage of structural hole occupancy in both individual and emergent contexts, suggesting that structural holes may be particularly advantageous for entrepreneurs. Thus, it is anticipated that high structural hole occupancy will be associated with greater new venture revenue.

> ***Hypothesis 3:*** *Network structural hole occupancy will be positively associated with new venture revenue.*

Implicit in theorizing to this point is the notion that network structure intercedes the relationship between trait narcissism and agreeableness in entrepreneurs and venture performance. Specifically, the model suggests that a narcissistic or agreeable personality affects the manner in which entrepreneurs operate relationally in the network; in turn, the resulting effects of these personality traits on the entrepreneur's network structure impact new venture performance. In other words, narcissism and agreeableness affect venture performance outcomes (i.e., revenue) through network structure (i.e., structural holes) resulting from social interactions. Previous research has supported this view, suggesting that "differential network positioning has an important impact on resource flows, and hence, on entrepreneurial outcomes" (Hoang & Antoncic, 2003, p. 166). Thus, the preceding arguments suggest that variations in behavior caused by high trait narcissism and agreeableness will affect the entrepreneur's network structure, which, in turn, affects venture revenue.

These expectations are further supported by limited extant research examining the connection between narcissism and entrepreneurial success. Prior research has generally linked narcissism and agreeableness to entrepreneurial antecedents such as entrepreneurial orientation (Shabbir & Kousar, 2019), innovation and invention (Leutner et al., 2014; Smith & Webster, 2018), leadership (Brunell et al., 2008; Grijalva et al., 2015; Grijalva & Harms, 2014), and

startup motivation (Hmieleski & Lerner, 2016). Despite this, the underlying mechanisms explaining the linkage of these key antecedents and the relational processes inherent in entrepreneurship remain unexplained. Socioanalytic theory suggests that personality is enacted via repeated social interactions. As such, it is likely that social contextual factors, such as social influence from proximal others and community norms, may exert significant influence on the broader relationship between entrepreneurship and traits of narcissism and agreeableness (Klotz & Neubaum, 2016; D. Miller, 2015). In line with these suggestions, I theorize that the effect of social structure, as comprised by the individual entrepreneur's occupancy of structural holes, is likely to act a contextual linkage explaining the underlying observed relationship between narcissism and agreeableness and entrepreneurial performance. In particular, structural holes are likely explain this underlying connection because the theory of structural holes (Burt, 1992) is conceptually based in notions of market competition. Thus, it is likely that a) narcissistic entrepreneurs relying on getting ahead skills are likely to seek out competitive structural hole occupancy, b) agreeable entrepreneurs relying on getting along skills will struggle to attain competitive structural hole occupancy, and c) that the competitive advantage provided by structural hole occupancy is likely to benefit new entrepreneurial performance. It is therefore expected that narcissism and agreeableness will indirectly influence new venture revenue through network structural holes.

> ***Hypothesis 4a:*** *Structural hole occupancy will mediate the relationship between trait narcissism and new venture revenue.*
>
> ***Hypothesis 4b:*** *Structural hole occupancy will mediate the relationship between agreeableness and new venture revenue.*

Moderating effects of social comparisons

To this point, I have applied socioanalytic theory to suggest that entrepreneurs high in trait narcissism rely heavily on getting ahead activities and will be more likely to purposefully build strategic, non-redundant social ties; as a result, they will be more likely to occupy network structural holes. Conversely, socioanalytic theory suggests that entrepreneurs high in agreeableness rely more on getting along activities and will be more likely to form organic, highly redundant social ties built on mutual interests and cooperation, and as a result, they will be less likely to occupy network structural holes. Because socioanalytic theory suggests that getting ahead and getting along behaviors are reinforced through social interaction, social comparison theory presents a salient perspective from which to examine the broader effects of social context via these repeated interactions. Building on these prior arguments, social comparison theory further suggests that proclivities toward getting ahead and getting along activities will be reinforced according the prevalence of narcissistic or agreeable personality traits in network proximal others.

Because entrepreneurship is an uncertain process and indicators of success are often subjective (Alvarez & Barney, 2007; Scott & Venkataraman, 2000), entrepreneurs are expected to carryout implicit social comparisons to evaluate their individual level of skill and aptitude through entrepreneurial processes. In keeping with social comparison theory (Festinger, 1954; Wood, 1989), I suggest that entrepreneurs will rely on the context of socially proximal others when forming these social evaluations. As entrepreneurs develop social relationships with network others during the venturing process, they will simultaneously engage in implicit social evaluations within this social context to guide their understanding of appropriate behaviors and activities necessary to carry out entrepreneurship (McGuire & Padawer-Singer, 1976; Messé &

Watts, 1983; Morse & Gergen, 1970; Wood, 1989). Research supports the notion that entrepreneurs make evaluations based on proximal others when making strategic decisions about the characteristics of their growing ventures (Martin-Sanchez et al., 2018). Thus, it may also be argued that entrepreneurs rely on implicit social evaluations when informing decisions about the kinds of behaviors that they engage in when carrying out entrepreneurship.

In specific, the proxy model of social comparison suggests that entrepreneurs are likely to engage in implicit evaluations of other entrepreneurs in order to predict and evaluate performance due to the uncertain nature of the entrepreneurial process (Martin, 2000). Because information in this context may be ambiguous at times, these evaluations are likely to rely on assessments of related attributes (Goethals & Darley, 1977). Thus, the proxy model indicates that entrepreneurs are likely to implicitly make evaluations of what is appropriate based on the related attributes of others in the social context. In doing so, they are likely to make implicit social evaluations in order to understand the appropriate attitudes and behaviors in that context, in this case, entrepreneurship. Thus, it is expected that entrepreneurs will assess their own behaviors by appraising them against the getting ahead and getting along behaviors of network proximal others.

Thus, a narcissistic entrepreneur who observes other network proximal entrepreneurs high in narcissistic traits will perceive narcissistic traits to be a common skill in the entrepreneurship process. As a result, their own narcissistic traits will be reinforced, and they will come to rely on them more heavily as they carry out entrepreneurship. Subsequently, the positive relationship between narcissism and structural holes will be strengthened. Conversely, narcissistic entrepreneurs who observe other network proximal entrepreneurs low in narcissistic traits will perceive that narcissistic traits are not commonly used in entrepreneurship. As a result,

they will rely less on these traits as they carry out entrepreneurship, and the relationship between narcissism and structural holes will be weakened. Thus, similar automatic social comparisons to narcissistic network others are expected to positively moderate the relationship between trait narcissism and structural holes, thereby reinforcing it.

> ***Hypothesis 5:*** *Average group narcissism moderates the relationship between narcissism and structural holes, such that the relationship is stronger (weaker) at higher (lower) levels of average group narcissism.*

A similar mechanism is proposed to underlie the relationship between agreeableness and structural holes. Specifically, a highly agreeable entrepreneur who observes other network proximal entrepreneurs high in agreeableness with perceive agreeableness to be a common skill in the entrepreneurial process. As a result, their own agreeableness will be reinforced, and they will come to rely more heavily on behaviors associated with agreeableness (e.g., altruism, cooperation; Graziano et al., 1997; Komarraju et al., 2003) as they carry out the venturing process. Therefore, the expected negative relationship between agreeableness and structural holes will be strengthened. Conversely, highly agreeable entrepreneurs who observe other network proximal entrepreneurs low in agreeable traits will perceive that agreeableness is not common among successful entrepreneurs. As a result, they will rely less on these traits as they carry out entrepreneurship, and the relationship between agreeableness and structural holes will be weakened, to an extent mitigating the anticipated negative relationship. Thus, similar automatic social comparisons to agreeable network others are expected to positively moderate the negative relationship between agreeableness and structural holes, thereby exacerbating it.

> ***Hypothesis 6:*** *Average group agreeableness moderates the relationship between agreeableness and structural holes, such that the relationship is stronger (weaker) at higher (lower) levels of agreeableness.*

CHAPTER III

ANALYTICAL STRATEGY AND METHODOLOGY

Sample and procedures

Entrepreneurship exists at the nexus of valuable opportunities and enterprising individuals. Entrepreneurs, therefore, are those enterprising individuals who "discover, evaluate, and exploit" (Scott & Venkataraman, 2000, p. 218) these potentially productive opportunities. In keeping with this definition, this dissertation draws on a sample of members of the Business Networking International (BNI) groups (de Mol et al., 2018; Pollack et al., 2015). BNI is the world's largest network referral association, generating $16.2 billion in referral revenue for member entrepreneurs annually. BNI membership encompasses solo entrepreneurs at both nascent and advanced levels as well as intrapreneurs seeking to produce innovation-driven growth for established businesses. BNI is organized into local chapters of entrepreneurs who meet regularly with the purpose of maintaining business networks, exchanging referrals, and increasing venture growth and revenue (BNI Global, 2019; Thompson, 2010).

The dataset used in this dissertation has been collected on 234 individual entrepreneurs embedded across 24 separate BNI groups within urban areas of a major city in the southeastern region of the United States. The mean size of the groups was 21.67 (*SD* = 11.4; *Min* = 10; *Max* = 47). The sample was 31.2% female, and the average age of all respondents was 50 years. At the time of data collection, the average respondent had been involved with BNI for 6.4 years.

Personality constructs were assessed using multiple psychometric scale-item measures. In addition, measures of referral, friendship, and advice networks were captured via sociometric, or full network, measurement tools. Sociometric network data is captured by asking all members of a network a series of questions concerning each individual member of the network. Questions capturing sociometric network information were assessed using the roster method (Marsden, 1990), in which participants are shown a roster of all individuals in the group and asked to report information related to their relationship with each group member. For example, to capture a friendship network, all members of a group would be shown a group roster and asked, "To what extent do you consider this person to be a friend?" Use of the roster method is recommended by social network analysts because it increases respondent recall and rater reliability (Perry et al., 2018).

Measures

Data was collected on multiple independent (narcissism and agreeableness), one dependent (new venture revenue), and three control variables (gender, age, and tenure in the BNI group). A sociometric data approach was used to collect referral network information to compute structural hole occupancy scores (Borgatti et al., 2013; Burt, 1992; Wasserman & Faust, 1994).

Venture revenue

Two measures of venture revenue were collected. First, revenue from the BNI network was collected via a self-report measure. Respondents were asked to indicate the total percentage of their annual revenue perceived to be generated as a result of their BNI membership over the previous 12-month period. Because referral income reflects the specific subset of income attributable to BNI membership, it more closely reflects the effects of individual network

structure within the group (Ho & Pollack, 2014). In addition, each entrepreneur also reported their total annual revenue for the same 12-month period.

Social network variables

Referral network data was collected using a single-item measures (e.g., Ibarra & Andrews, 1993; Umphress et al., 2003; Zagenczyk et al., 2010). Multi-item scales are usually impractical to administer in social network research due to respondent error caused by rater fatigue and lengthy survey time. Because of the nature of social network research, the use of multi-item scales would require respondents to answer surveys of hundreds of items, resulting in lower response rates and increased error via respondent fatigue (Borgatti et al., 2013; Perry et al., 2018). Resultingly, social network research regularly relies on single-item measures in assessing dyadic network relationships between egos (e.g., focal respondents) and alters (e.g., network others; Ibarra & Andrews, 1993).

In order to capture ongoing relationships, referral ties were assessed by asking each respondent to report the number of referrals received from each member of their BNI group over the previous twelve-month period. Using this raw data, matrixes were then constructed for referral networks in which rows and columns represent network actors and cells represent ties between actors (Wasserman & Faust, 1994), as appropriate for two-mode data. Using this method, for example, a "12" in cell X_{ij} in the referral matrix would represent that actor *i* received 12 referrals from actor *j* over the previous twelve-month period.

Structural holes

Structural holes were calculated using raw score responses to measurement items. Because of its high predictive validity in organizational research (Perry et al., 2018), Burt's

(1992) constraint index is used to assess the number of structural holes of each respondent. This measure considers the number of alters to which an ego in connected and the subsequent independence of their alters. Constraint is an inverse measure of structural holes; larger values indicate lower structural hole occupancy. Constraint was calculated using the *UCINET* statistical package (Borgatti et al., 2006).

Narcissism

Two measures of trait narcissism were collected. First, the short, 13-item version of the narcissistic personality inventory (NPI-13) was collected as the primary measure of narcissism (Gentile et al., 2013); Cronbach's alpha for this measure was calculated to be .66, indicating acceptable reliability (Churchil Jr., 1979; Cortina, 1993; Nunnally, 1967). The NPI-13 is a dyadic forced-choice measure; as such, each item asks respondents to choose between two statement options, one of which represents the presence of a narcissistic trait. The NPI-13 is advantageous because it retains the original three-factor structure of its parent measure, the NPI-40 (Raskin & Terry, 1988), while offering a significantly shorter measure, thereby reducing rater error. Second, the nine-item narcissism sub-scale of the short-dark triad (SD3) measure (Jones & Paulhus, 2014) was collected. The NPI-13 is used as this study's primary measure of narcissism. The narcissism subscale of the SD3 was also collected because it conceptually captures the grandiose characteristics of narcissism on which much of my argumentation relies upon. In addition, research has consistently found grandiosity to be a key aspect of subclinical narcissism (Brown, Budzek, & Tamborski, 2009; Miller & Campbell, 2008). Cronbach's alpha for this measure is .64, indicating acceptable reliability. Responses were measured on a seven-point Likert scale ranging from 1= "strongly disagree" to 7= "strongly agree." The narcissism subscale

of the SD3 is used as a robustness check in post-hoc analysis. Complete items can be found in Table 3.1.

Agreeableness

Agreeableness was measures using the four-item agreeableness subscale from the mini-IPIP scale (Donnellan et al., 2006). The original Cronbach's alpha for this measure is 0.80, indicating acceptable reliability. Responses were measured on a seven-point Likert scale ranging from 1= "strongly disagree" to 7= "strongly agree." Complete items can be found in Table 3.1.

Control variables

Gender, age, and tenure in the BNI group will be controlled for. Tenure in the BNI group was operationalized based on participants' reported date they first joined BNI. I controlled for tenure to rule out the possibility that dependent variables could be caused by long-term benefits of BNI group membership rather than the focal personality traits. Because research has produced ambiguous findings on the relationship between an individual entrepreneur's age and venture outcomes (Levesque & Minniti, 2011; Zhang & Acs, 2018), I also controlled for age. The analysis also controls for gender (a dummy variable in which 0 = male and 1= female) in light of mounting theoretical (Ahl & Marlow, 2012; Bird & Brush, 2002) and empirical (Abraham, 2020; Burt, 2019b; Malmström et al., 2017) work indicating that social effects on entrepreneurship are likely to differ between genders. Finally, I also controlled for self-rated measures of the remaining Big Five Personality Traits (Barrick & Mount, 1991)to rule out the possible influence of exogenous personality variables. Donnellan and colleagues' (2006) Mini IPIP scales were used to measure extraversion ($\alpha = .72$), openness to experience ($\alpha = .67$), emotional stability ($\alpha = .86$), and conscientiousness ($\alpha = .81$)

Table 3.1 Measurement Scale Items

Variable	Item
NPI-13*	
	1. (a) I find it easy to manipulate people. (R) (b) I don't like it when I find myself manipulating people. 2. (a) When people compliment me I get embarrassed. (b) I know that I am a good person because everybody keeps telling me so. 3. (a) I like having authority over other people. (R) (b) I don't mind following orders. 4. (a) I insist upon getting the respect that is due me. (R) (b) I usually get the respect I deserve. 5. (a) I don't particularly like to show off my body. (b) I like to show off my body. 6. (a) I have a strong will to power. (R) (b) Power for its own sake doesn't interest me. 7. (a) I expect a great deal from other people. (R) (b) I like to do things for other people. 8. (a) My body is nothing special. (b) I like to look at my body. 9. (a)Being an authority doesn't mean much to me. (b)People always seem to recognize my authority. 10. (a)I will never be satisfied until I get all that I deserve. (R) (b) I will take my satisfactions as they come. 11. (a) I try not to be a showoff. (b) I will usually show off if I get the chance. 12. (a) I am a born leader. (R) (b) Leadership is a quality that takes a long time to develop. 13. (a) I like to look at myself in the mirror. (b) I am not particularly interested in looking at myself in the mirror. (R)
Short-Dark Triad	1. People see me as a natural leader. 2. I hate being the center of attention. (R) 3. I am an average person. (R) 4. Many group activities tend to be dull without me. 5. I know that I am special because everyone keeps telling me so. 6. I like to get acquainted with important people. 7. I feel embarrassed if someone compliments me. (R) 8. I insist upon getting the respect that I deserve. 9. I have been compared to famous people.

Table 3.1 Continued

Agreeableness	1. At work, I sympathize with others' feelings. 2. I show interest in other people's work problems at work. 3. At work, I feel others' emotions. 4. I care about others at work.

The NPI-13 is a dyadic forced-choice measure; respondents select between two choices for each numbered item, where one choice indicates presence of a narcissistic trait. (R) indicates a reverse-coded item.

Analysis and aggregation

Because participants are nested within 24 distinct groups, two-level models were employed in which level-1 observations comprised of individuals (N=280) are nested with level-2 BNI groups (N=24). To test this notion, I calculated ICCs to estimate the amount of variance in the measures attributable to group membership. Results indicate a significant ICC(1) value for the NPI-13 (ICC(1)= .07; LeBreton & Senter, 2008). As such, Model 1 hypotheses were tested using a linear mixed effects model (Lindstrom & Bates, 1988). However, results indicated an insignificant ICC(1) value for the independent variable of agreeableness (ICC(1)= .00); therefore, OLS regressions were used to test Model 2. To test the moderating effects proposed in hypotheses 5 and 6, I first entered control and variable and main effects into linear mixed effects models and regressions (Step 1), followed by the multiplicative interaction terms in a second step.

Traditional nonparametric bootstrap mediation methods (Preacher & Hayes, 2004) present unique challenges in multilevel datasets because assumptions of non-independence of observations are violated (Preacher & Selig, 2012). Instead, the indirect effect proposed in hypotheses 4a was tested using linear mixed effects models to calculate the a- and b-paths and a quasi-Bayesian Monte-Carlo approximation to calculate mediation confidence intervals (Bliese, 2016a; Imai, Keele, & Tingley, 2010). These tests were completed using the *R* and *RStudio*

statistical software (R Core Team, 2020; R Studio Team, 2020), including packages *multilevel* (Bliese, 2016)*, lme4* (Bates et al., 2015)*, nlme* (Pinherio et al., 2020), *mediation* (Tingley et al., 2014), and *mitml* (Grund et al., 2019). Because the ICC(1) and ICC(2) values for agreeableness were insignificant, the indirect effect proposed in hypothesis 4b was tested using OLS regressions to calculate the a- and b-paths and a traditional nonparametric bootstrap (Preacher & Hayes, 2004) to calculate mediation confidence intervals. These tests were carried out using the PROCESS macro (Hayes, 2013) for SPSS Version 28.

Tests of the moderating effects of implicit social comparisons in Hypotheses 5 and 6 rely upon the aggregation of individual-level (level-1) perceptions into group-level (level-2) scores in order to capture the individual's implicit comparison of their own traits to the aggregated traits of the group, as a whole. Conceptually and empirically, these group-level scores are measured as a group mean of the focal variable (Bassis, 1977; Bliese & Jex, 2002; Klein et al., 1994; Kozlowski & Klein, Katherine, 2000; Vardaman et al., 2016). Thus, this study measures group trait narcissism and agreeableness via group means. The results suggest satisfactory levels of agreement among within-group raters for the NPI-13 (ICC(2)=0.40), suggesting that sufficient levels of within-group variation exist to justify level-2 aggregation of the measure. In addition, the significant ICC(2) value provides further support for the proposed moderating effect of group-level narcissism (Lebreton et al., 2003; LeBreton & Senter, 2008). However, the ICC(2) value for agreeableness was not significant (ICC(2)= .00), indicating that level-2 aggregation of this measure is not justifiable (LeBreton & Senter, 2008).

Finally, models with multiple *X* variables can be difficult to test, and they often require the modification of common analytical methods. As a result, researchers employing models with multiple independent variables can choose to either a) test a single model with multiple *X*

variables or b) test multiple models, each with a single *X* variable. Because either choice can be acceptable (e.g., Gibbs et al., 2011; Von Hippel et al., 2011), it is important that the choice of technique used is made in line with the underlying theoretical framework (Hayes, 2013). This dissertation seeks to understand how the prevalence of an entrepreneur's dark or light personality traits interact with the dark or light personality traits of network proximal others to influence venture performance via network structure. As such, the co-occurrence of levels of trait narcissism and agreeableness within one individual is not of interest. Rather, the research questions seek to understand, for example, how a highly narcissistic entrepreneur's performance is influenced by the prevalence, or lack therefore, of narcissism among others in their group. As a result, this dissertation tests the hypothesized relationships via the use of two models, each with a single *X* variable. The hypothesized models are shown in Figure 5.

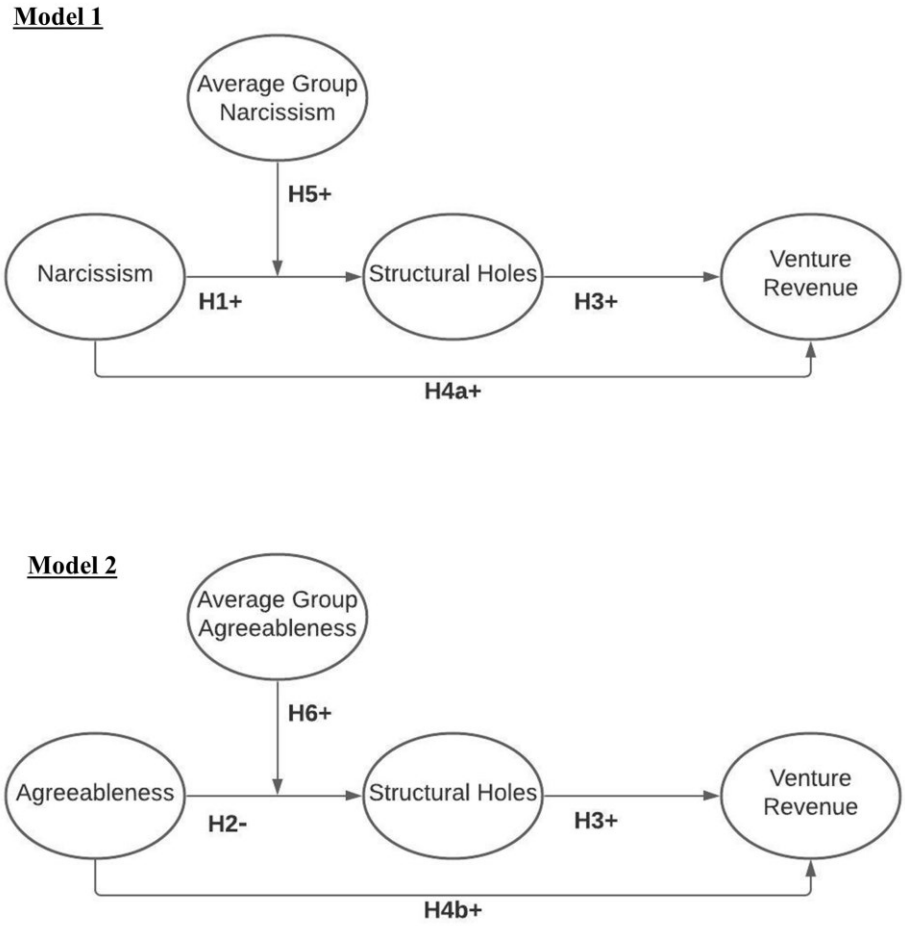

Figure 3.1 Hypothesized model

CHAPTER IV

RESULTS

Results

Means, standard deviations, and correlations are reported in Table 4.1. Hypothesis 1 proposed that narcissism (NPI-13) is positively related to structural holes. Results in Table 4.2 show that the relationship is positive and approaching significance ($b = 0.16$, $p < .06$). Although hypothesis 1 is not supported according to the cutoff for significance at p-value less than .05, this result provides evidence for a potentially interesting relationship between narcissism and structural holes (Meyer, Witteloostuijn, & Beugelsdisk, 2017). Hypothesis 2 proposed that agreeableness would be negatively related to structural holes. Results in Table 4.2 show that the relationship is negative but not significant ($b = -0.01$, $p = .73$); therefore, hypothesis 2 is not supported. Hypothesis 3 proposed that structural holes would be positively related to venture revenue. Results from Table 4.2 demonstrate that the relationship is positive and significant in both Model 1 ($b = 18.29$, $p < .01$) and Model 2 ($b = 18.68$, $p = .01$), supporting hypothesis 3. Hypothesis 4 proposed that structural holes would mediate the relationship between a) narcissism and venture revenue and b) agreeableness and venture revenue. Results for the mediation analysis in Table 4.3 show that the indirect effect of narcissism onto venture revenue via structural holes is positive and approaching significance ($b = 2.94$, 95% CI [-0.10, 7.53], $p = .06$). Thus, although hypothesis 4a is not supported, there is evidence of a potentially interesting indirect relationship (Meyer et al., 2017). The indirect effect of agreeableness onto new venture

revenue via structural holes is not significant (b = -0.14, 95% CI [-0.95, 0.65], p = .68); thus, hypothesis 4b is not supported.

Hypothesis 5 proposed that average group-narcissism would moderate the relationship between narcissism and structural holes, such that the relationship is stronger (weaker) at higher (lower) levels of average group narcissism, exacerbating the positive relationship between narcissism and structural holes. The multiplicative interaction term of individual-level and group-level narcissism entered in Step 2 was not significant (b = 1.08, p = .36). Thus, hypothesis 5 is not supported. However, as shown in Table 4.3, there is a significant indirect effect of narcissism onto venture revenue via structural holes at higher levels (b = 3.89, 95% CI [0.04, 9.56], p =.04), but not lower (b = 1.19, 95% CI [-3.83, 6.68], p =.62) levels of group-average narcissism, providing limited support for hypotheses 4a and 5 and suggesting that these relationships should be probed further.

Finally, hypothesis 6 proposed that average group agreeableness moderates the relationship between agreeableness and structural holes, such that the relationship is stronger (weaker) at higher (lower) levels of agreeableness, exacerbating the negative relationship between agreeableness and structural holes. Because the ICC(1) and ICC(2) values for agreeableness were not significant, I was unable to aggregate level-1 individual agreeableness ratings to an aggregate level-2 measure of group-level agreeableness. Thus, hypothesis 6 is untestable and unsupported.

Table 4.1 Means, Standard Deviations, and Correlations of Main Study Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11
Level-1													
1. NPI-13	1.24	0.17	(.66)										
2. Agreeableness	5.90	0.79	-.04	(.80)									
3. Constraint (SH)	0.51	0.22	.06	.02	--								
4. Revenue (BNI%)	18.73	21.12	-.06	.07	.24**	--							
5. Gender	0.31	0.46	-.08	.07	.06	.10	--						
6. Age	50.22	10.72	-.08	.01	.08	.04	-.11	--					
7. Tenure in BNI group	6.64	3.00	-.06	.03	.19**	.24**	-.04	.17**	--				
8. Extraversion	6.00	0.71	.10	.27**	.12	.10	.06	-.09	.05	(.72)			
9. Openness to experience	5.93	0.73	.17**	.39**	.08	.05	.14*	.010	-.11	.31**	(.67)		
10. Emotional stability	5.27	1.08	.01	.11	.02	.02	.09	.10	-.10	.17**	.24**	(.86)	
11. Conscientiousness	5.49	0.99	.04	.27**	-.03	.06	.04	.02	-.04	.23**	.10	.27**	(.81)
Level-2													
Group Narcissism (NPI)	1.24	0.07											
Group Agreeableness	5.90	0.21											

Reliabilities (Cronbach's alphas) are shown in parentheses on the diagonal. *N*=234 at individual level. *N*=24 at group level. Gender variable is dummy coded (1=female). The NPI variable is a forced choice measure (1=not narcissistic, 2=narcissistic). *SH* refers to structural holes. *BNI%* refers to the percentage of respondent's revenue that is directly attributable to BNI membership.
*$p < .05$; **$p< < .01$

Table 4.2 Linear Mixed Effects (Model1) and Regression (Model 2) Results for Constraint and BNI Percent Venture Revenue in Referral Network

	Model 1						**Model 2**					
	Constraint[a]			**Revenue (BNI%)[b]**			**Constraint[c]**			**Revenue (BNI%)[d]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	0.62	0.43	1.42	-12.26	30.30	-0.40	0.05	0.20	0.23	-12.41	18.67	-0.67
NPI-13	0.16’	0.09	1.87	-8.41	8.78	-0.96	0.08	0.09	0.88	-7.71	7.90	-0.98
Group NPI-13	-0.57’	0.33	-1.72	0.03	22.40	0.00	--	--	--	--	--	--
Agreeableness	0.00	0.02	-0.05	0.31	1.93	0.16	-0.01	0.02	-0.35	0.37	1.92	0.19
Constraint (SH)	--	--	--	18.29**	6.39	2.86	--	--	--	18.68**	6.23	3.00
Gender	0.04	0.03	1.28	3.38	2.97	1.14	0.03	0.03	1.06	3.71	2.94	1.26
Tenure in BNI Group	0.01*	0.00	2.57	1.42**	0.47	3.02	0.01**	0.01	2.79	1.48**	0.47	3.17
Age	0.00	0.00	1.20	-0.03	0.13	-0.26	0.00	0.00	0.97	-0.02	0.13	-0.16
Extraversion	0.05*	0.02	2.26	1.10	2.08	0.53	0.03	0.02	1.49	1.15	2.07	0.56
Openness to experience	0.01	0.02	0.61	1.25	2.18	0.57	0.02	0.02	0.80	1.05	2.16	0.49
Emotional stability	-0.01	0.01	-0.54	0.02	1.33	0.02	0.00	0.01	0.15	-0.03	1.33	-0.02
Conscientousness	-0.02	0.01	-1.05	1.30	1.49	0.87	-0.01	0.02	-0.83	1.11	1.47	0.75

SH refers to structural holes. *BNI%* refers to the percentage of respondent’s revenue that is directly attributable to BNI membership. Unstandardized coefficients from linear mixed effects model are reported, a. R^2=.09; b. R^2=.11; c. R^2=.07; d. R^2=.12

* $p < .05$; ** $p < .01$; ‘$p < .10$

Table 4.3 Indirect Affects onto BNI Percent Venture Revenue

	Estimate	95% CI Lower	95% CI Upper	*P*-value
Narcissism (NPI-13)				
Mean group narcissism (1.24)				
Indirect effect	2.94	-0.10	7.53	.06
Direct effect	-8.26	-25.47	8.92	.33
Total effect	-5.32	-22.47	12.00	.54
-1 SD group narcissism (1.17)	1.19	-3.83	6.68	.62
+1 SD group narcissism (1.31)	3.89	0.04	9.56	.04
Agreeableness				
Mean group agreeableness (5.90)				
Indirect effect	-0.14	-0.95	0.65	.68
Direct effect	0.37	-3.41	4.15	.85
Total effect	0.23	-3.62	4.08	.91

Control variables included in model. Number of samples for Quasi-Bayesian confidence intervals (Model1) and non-parametric bootstrapping (Model 2) is 5000.

Post hoc tests

Due to the overall mixed support for the hypothesized model, I completed a number of post hoc tests to further explore the relationships among the key variables, with particular interest paid to whether the operationalizations of the constructs of interests could be affecting the results. Thus, I repeated analysis of the model several times using alternative measures of the primary independent (narcissism, agreeableness, structural holes) and dependent (venture revenue) variables. Means, standard deviations, and correlations of all variables used in the replications can be found in Table 4.4.

First, I repeated the analysis using alternative measures of structural holes, including accepted measures of effective network size and efficiency (Burt, 1992). The effective network

size measure captures structural holes by estimating a focal actor's number of non-redundant network ties to all network others. The efficiency measure of structural holes captures a standardized measure of effective network size; efficiency is calculated as a focal actor's proportion of non-redundant network ties to the number of all possible network ties. As shown in Tables 4.5-4.6, the pattern of results remains consistent. Although narcissism (NPI-13) is not significantly related to either effective network size (b = -2.57, p = .14) or efficiency (b = -0.01, p < .85), both effective network size (b = 1.26, p < .01) and efficiency (b =27.83, p < .05) are positively related to venture revenue in Model 1 (further supporting hypothesis 3). The multiplicative interaction term of individual-level and group-level narcissism entered in Step 2 was not significantly related to effective network size (b = -4.29, p = .86) or network efficiency (b = 0.18, p = .79). As shown in Table 4.7, neither the indirect effect of individual narcissism (at mean levels) onto venture revenue via effective network size (b = 3.36, 95% CI [-0.95, 8.62], p =.13) nor network efficiency (b = -0.37, 95% CI [-3.63, 2.54], p =.80) is significant.

As shown in tables 4.5 and 4.6, there is no evidence that agreeableness is related to either effective network size (b = 0.42, p = .33) or network efficiency (b = -0.01, p = .40). Despite this, both effective network size (b = 1.26, p < .01) and network efficiency (b = 27.83, p < .05) are positively and significantly related to venture revenue in Model 2. There is no indirect effect of individual agreeableness onto venture revenue via either effective network size (b = 0.53, 95% CI [-0.43, 1.58], p =.30) or network efficiency (b = -0.26, 95% CI [-1.16, 0.32], p = .33).

Table 4.4 Means, Standard Deviations, and Correlations of Variables Included in Post Hoc Tests

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
Level-1												
1. NPI-13	1.24	0.17	(.66)									
2. Narcissism (SD3)	4.09	0.65	.55**	(.64)								
3. Peer NPI-13	2.68	0.79	.16*	.17*	(.87)							
4. Agreeableness	5.90	0.79	-.04	.06	.02	(.80)						
5. Peer agreeableness	5.98	0.62	-.11	-.06	-.32**	.06	--					
6. Constraint (SH referral)	0.62	0.22	.06	.02	.14*	.02	.03	--				
7. Effective network size (SH referral)	7.47	4.58	.07	.04	.15*	.05	-.04	.75**	--			
8. Efficiency (SH referral)	0.73	0.13	-.04	-.07	.14*	-.01	.13*	.64**	.53**	--		
9. Constraint (SH advice)	0.51	0.22	-.01	-.08	-.00	.10	-.01	.31**	.30**	.00	--	
10. Constraint (SH friendship)	0.64	0.20	-.02	-.11	-.01	.13*	-.03	.33**	.31**	.03	.80**	--
11. Revenue (BNI%)	18.73	21.12	-.06	.11	.08	.07	.01	.24**	.30**	.19**	.02	-.01
12. Actual revenue	162.26	120.19	.16*	-.02	-.03	.03	.04	.10	.11	-.05	.17*	.18**
Level-2												
Group NPI	1.24	0.07										
Group narcissism (SD3)	4.09	0.25										
Group peer narcissism	2.68	0.60										
Group agreeableness	5.90	0.21										
Group peer agreeableness	5.98	0.42										

Reliabilities (Cronbach's alphas) are shown in parentheses on the diagonal. N=234 at individual level. N=24 at group level. Gender variable is dummy coded (1=female). Actual revenue is reported in units of thousands. The NPI variables is a forced choice measure (1=not narcissistic, 2=narcissistic). SH refers to structural holes. BNI% refers to the percentage of respondent's revenue that is directly attributable to BNI membership. *$p < .05$; **$p < .01$

Table 4.5 Linear Mixed Effects (Model 1) and Regression (Model 2) Results for Effective Network Size (Post Hoc) and BNI Percent Venture Revenue in Referral Network

	Model 1						**Model 2**					
	Effective Network Size[a]			**Revenue (BNI%)[b]**			**Effective Network Size[c]**			**Revenue (BNI%)[d]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	3.63	9.10	0.40	-3.97	28.01	-0.14	-1.09	4.13	-0.26	-10.60	18.34	-0.58
NPI-13	2.57	1.71	1.50	-8.57	8.65	-0.99	2.73	1.75	1.56	-9.13	7.81	-1.17
Group NPI-13	-4.82	7.02	-0.69	-6.10	20.45	-0.30	--	--	--	--	--	--
Agreeableness	0.66’	0.39	1.70	-0.35	1.90	-0.19	0.42	0.43	0.98	-0.68	1.94	-0.35
Effective network size (SH)	--	--	--	1.26**	0.30	4.23	--	--	--	1.26**	0.30	4.23
Gender	0.12	0.60	0.21	3.79	2.91	1.30	0.52	0.65	0.81	3.90	2.90	1.35
Tenure in BNI group	0.29**	0.10	3.09	1.31**	0.46	2.85	0.32**	0.10	3.14	1.32**	0.46	2.88
Age	0.03	0.03	1.28	-0.06	0.13	-0.44	0.05*	0.03	1.69	-0.06	0.13	-0.49
Extraversion	0.25	0.42	0.61	1.87	2.02	0.92	-0.05	0.46	-0.11	2.00	2.03	0.99
Openness to experience	-0.29	0.44	-0.65	1.53	2.13	0.72	-0.09	0.48	-0.18	1.71	2.13	0.80
Emotional stability	0.05	0.27	0.18	-0.23	1.31	-0.18	0.21	0.29	0.70	-0.19	1.31	-0.15
Conscientousness	-0.25	0.30	-0.83	1.34	1.46	0.92	-0.42	0.32	-1.31	1.32	1.44	0.92

SH refers to Structural Holes. *BNI%* refers to the percentage of respondent’s revenue that is directly attributable to BNI membership. Unstandardized coefficients from linear mixed effects model are reported, a. R^2=.07; b. R^2=.17; c. R^2=.08; d. R^2=.15

*$p < .05$; **$p < .01$, ‘$p < .10$

Table 4.6 Linear Mixed Effects (Model 1) and Regression (Model 2) Results for Network Efficiency (Post Hoc) and BNI Percent Venture Revenue in Referral Network

	Model 1						**Model 2**					
	Network Efficiency[a]			**Revenue (BNI%)[b]**			**Network Efficiency[c]**			**Revenue (BNI%)[d]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	0.72*	0.30	2.37	-20.73	32.99	-0.63	0.63**	0.12	5.44	-28.10	20.04	-1.40
NPI-13	-0.01	0.05	-0.20	-5.38	8.69	-0.62	-0.03	0.05	-0.53	-5.02	7.98	-0.63
Group NPI-13	-0.09	0.24	-0.38	-8.28	23.80	-0.35	--	--	--	--	--	--
Agreeableness	0.01	0.01	0.51	0.30	1.94	0.16	-0.01	0.01	-0.85	0.12	1.99	0.06
Network efficiency (SH)	--	--	--	27.83*	11.09	2.51	--	--	--	25.43*	10.81	2.35
Gender	0.02	0.02	1.09	3.12	2.98	1.04	0.03’	0.02	1.78	3.73	2.99	1.25
Tenure in BNI Group	0.00	0.00	1.20	1.51**	0.47	3.24	0.00	0.00	1.12	1.64**	0.46	3.54
Age	0.00	0.00	1.03	-0.03	0.13	-0.23	0.00	0.00	0.48	-0.01	0.13	-0.08
Extraversion	0.01	0.01	0.87	1.63	2.07	0.79	0.00	0.01	0.36	1.82	2.08	0.88
Openness to experience	0.00	0.01	0.04	1.38	2.19	0.63	0.02	0.01	1.33	1.14	2.20	0.52
Emotional stability	0.00	0.01	-0.03	-0.05	1.33	-0.04	0.01	0.01	0.60	-0.06	1.35	-0.04
Conscientousness	0.00	0.01	-0.40	1.24	1.49	0.83	0.00	0.01	-0.46	0.90	1.48	0.61

SH refers to structural holes. *BNI%* refers to the percentage of respondent’s revenue that is directly attributable to BNI membership. Unstandardized coefficients from linear mixed effects model are reported, *a.* R^2=.02; *b*. R^2=.10; *c*. R^2=.04; *d*. R^2=.11

*$p < .05$; **$p < .01$, ‘$p < .10$

Table 4.7 Indirect Effects onto BNI Percent Venture Revenue via Effective Network Size and Network Efficiency (Post Hoc)

	Effective Network Size				Network Efficiency			
	Estimate	**95% CI Lower**	**95% CI Upper**	***P*-value**	**Estimate**	**95% CI Lower**	**95% CI Upper**	***P*-value**
Narcissism (NPI-13)								
Mean group narcissism (1.24)								
Indirect effect	3.36	-0.95	8.62	.13	-0.37	-3.63	2.54	.80
Direct effect	-9.43	27.12	8.04	.29	-5.97	.23.32	11.73	.52
Total effect	-6.07	-24.00	12.15	.50	-6.34	-24.06	11.80	.49
-1 SD group narcissism (1.17)	3.69	-2.98	11.6	.27	-0.66	-5.52	3.61	.75
+1 SD group narcissism (1.31)	2.96	-2.23	9.05	.27	-0.01	-3.69	3.61	.99
Agreeableness								
Mean group agreeableness (5.90)								
Indirect effect	0.53	-0.43	1.58	.30	-0.26	-1.16	0.32	.33
Direct effect	-0.68	-4.49	3.13	.75	0.12	-3.80	4.03	.95
Total effect	-0.15	-4.09	3.80	.94	-0.15	-4.09	3.80	.94

Control variables included in model. Number of samples for Quasi-Bayesian confidence intervals (Model1) and non-parametric bootstrapping (Model 2) is 5000.

To further explore these relationships, I repeated the analysis a third time using an alternative measure of venture revenue, operationalized as the respondent's self-reported total venture revenue for the 12-month period immediately preceding data collection. As shown in Tables 4.8-4.9, the pattern of results differed when revenue was examined as total venture revenue, rather than the original measure of revenue, which more directly captured network effects on performance (Ho & Pollack, 2014). As shown in Table 4.8, when total revenue is entered into the regressions as dependent variable, structural holes (as measured by constraint) is no longer significantly related to venture revenue in either Model 1 (b = 56.95, p = .11) on Model 2 (b = 51.07, p = .15). Further, as shown in Table 4.9, there is no evidence that either the NPI-13 (b = 9.47, 95% CI [-2.43, 30.10], p = .16) or agreeableness (b = -0.37, 95% CI [-3.15, 2.03], p = .66) indirectly effects actual venture revenue via structural holes.

Next, I repeated the analysis using the narcissism subscale of the SD3 measure to calculate both individual and group-level narcissism (Jones & Paulhus, 2014). Although the NPI continues to be one of the most relied upon measures of narcissism in organizational research (Back et al., 2013; Brown, Budzek, & Tamborski, 2011) personality researchers have recently begun to note problems with the NPI as a measurement tool, including low convergent validity and internal reliability, limited correlations with constructs within the same domain (e.g., neuroticism, loneliness), and an inconsistent factor structure (Miller & Campbell, 2008). Nonetheless, I chose to rely on the NPI as my primary measure of narcissism due to the fact that narcissism researchers publishing in top journals continue to endorse use of the NPI (e.g., Ahmad, Klotz, & Bolino, 2021; Howes et al., 2020; Grijalva et al., 2020). Despite this fact, I also chose to include a post-hoc test relying on the SD3 due lingering problems related to the NPI and the conceptual alignment of the narcissism subscale of the SD3 with my theoretical

argumentation (i.e., narcissistic grandiose and self-important tendencies; Brown, Budzek, & Tamborski, 2009; Miller & Campbell, 2008). As shown in Table 4.10, regression results differ when narcissism is operationalized in this manner. The relationship between narcissism and structural holes is not significant (b = 0.01, p = .78), and structural holes remains positively and significantly related to venture revenue (b = 19.08, p< .01). However, the multiplicative interaction term of individual-narcissism and group-narcissism entered in Step 2 is positively and significantly related to structural holes (b = 0.16, p = .04), showing limited support for hypothesis 5. Despite the significant interaction term, there is no support for the indirect effect of narcissism onto venture revenue via structural holes at high (b = 0.74, 95% CI [-0.30, 2.11], p = .17), mean (b = 0.05, 95% CI [-0.88, 0.99], p = .91), or low (b = -0.70, 95% CI [-2.21, 2.11], p = .17) levels of group-level narcissism, as shown in Table 4.11.

I also conducted additional analyses using the constraint structural hole measure captured from social networks of alternative content, including friendship and advice from the 24 groups. Although my hypotheses are built on the assumption that entrepreneurs with narcissistic or agreeable personality traits are likely to foster differing perceptions of the extent to which professional referral exchange relationships are utilitarian, this logic may also extend to other types of relationships. Extant research has shown that the social capital and affective support provided to entrepreneurs via expressive friendship and instrumental advice networks is critical in the venturing process (Arregle et al., 2015; Greve & Salaff, 2003; Hoang & Antoncic, 2003), and that entrepreneurs are aware of the potential for these types of relationships to be leveraged for venture benefit. As such, evidence of a similar pattern of findings in friendship and advice networks could provide further support for the hypothesized relationships as well as interesting avenues for future research.

Table 4.8 Linear Mixed Effects (Model 1) and Regression (Model 2) Results for Constraint and Actual Venture Revenue (Post Hoc) in Referral Network

	Model 1						**Model 2**					
	Constraint[a]			**Actual Revenue[b]**			**Constraint[c]**			**Actual Revenue[d]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	0.62	0.43	1.42	-87.30	161.66	-0.54	0.05	0.20	0.23	46.96	106.02	0.44
NPI-13	0.16’	0.09	1.87	73.13	50.10	1.46	0.07	0.08	0.88	97.78*	44.82	2.18
Group NPI-13	-0.57’	0.33	-1.72	130.06	118.27	1.10	--	--	--	--	--	--
Agreeableness	0.00	0.02	-0.05	6.47	10.93	0.59	-0.01	0.02	-0.35	7.54	10.89	0.69
Constraint (SH)	--	--	--	56.95	35.73	1.59	--	--	--	51.07	35.35	1.44
Gender	0.04	0.03	1.28	-58.87**	16.84	-3.50	0.03	0.03	1.06	-56.39**	16.69	-3.38
Tenure in BNI group	0.01*	0.00	2.57	5.96*	2.65	2.25	0.01**	0.00	2.79	5.91*	2.65	2.23
Age	0.00	0.00	1.20	-1.92*	0.74	-2.61	0.00	0.00	0.97	-1.86*	0.73	-2.53
Extraversion	0.05*	0.02	2.26	-3.69	11.73	-0.31	0.03	0.02	1.49	-3.07	11.73	-0.26
Openness to experience	0.01	0.02	0.61	-8.29	12.33	-0.67	0.02	0.02	0.80	-9.42	12.29	-0.77
Emotional stability	-0.01	0.01	-0.54	5.70	7.56	0.75	0.00	0.01	0.15	5.62	7.56	0.74
Conscientousness	-0.02	0.01	-1.05	8.63	8.41	1.03	-0.01	0.02	-0.83	7.25	8.32	0.87

Actual revenue is reported in units of thousands. *SH* refers to structural holes. Unstandardized coefficients from linear mixed effects model are reported, *a.* R^2=.09; *b*. R^2=.12; *c*. R^2=.07; *d*. R^2=.12

* $p < .05$; ** $p < .01$, ‘$p < .10$

Table 4.9 Indirect Effects onto Actual Venture Revenue (Post Hoc) via Constraint

	Estimate	95% CI Lower	95% CI Upper	*P*-value
Narcissism (NPI-13)				
Mean group narcissism (1.24)				
Indirect effect	9.47	-2.43	30.10	.16
Direct effect	72.01	-28.06	172.32	.15
Total effect	81.48	-18.88	181.34	.10
-1 SD group narcissism (1.17)	8.81	-2.75	28.32	.17
+1 SD group narcissism (1.31)	8.92	+2.67	27.78	.16
Agreeableness				
Mean group agreeableness (5.90)				
Indirect effect	-0.37	-3.15	2.03	.66
Direct effect	7.54	-13.93	29.00	.49
Total effect	7.17	-14.35	28.68	.51

Control variables included in model. Number of samples for Quasi-Bayesian confidence intervals (Model1) and non-parametric bootstrapping (Model 2) is 5000.

Table 4.10 Linear Mixed Effects Results for Constraint and BNI Percent Venture Revenue in Referral Network (SD3 Post Hoc)

	Model 1					
	Constraint[a]			**Revenue (BNI%)[b]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	0.61	0.40	1.53	-50.92’	27.37	-1.86
Narcissism (SD3)	0.01	0.02	0.28	3.08	2.37	1.30
Group narcissism (SD3)	-0.14	0.09	-1.49	5.62	5.87	0.96
Agreeableness	-0.01	0.02	-0.36	0.78	1.90	0.41
Constraint (SH)	--	--	--	19.08**	6.22	3.07
Gender	0.03	0.03	0.89	4.73	2.93	1.62
Tenure in BNI group	0.01*	0.00	2.61	1.53**	0.46	3.29
Sex	0.00	0.00	1.06	0.00	0.13	-0.03
Extraversion	0.05*	0.02	2.25	0.13	2.11	0.06
Openness to experience	0.02	0.02	1.03	-0.10	2.16	-0.05
Emotional stability	-0.01	0.01	-0.52	0.13	1.33	0.10
Conscientousness	-0.01	0.02	-0.91	1.36	1.48	0.92

SH refers to structural holes. *BNI%* refers to the percentage of respondent’s revenue that is directly attributable to BNI membership. Unstandardized coefficients from linear mixed effects model are reported, *a.* R^2=.08; *b*. R^2=.13

* $p < .05$; ** $p < .01$, ‘$p < .10$

Table 4.11 Indirect Effects onto BNI Percent Venture Revenue via Structural Holes (SD3 Post Hoc)

	Estimate	95% CI Lower	95% CI Upper	*P*-value
Narcissism (SD3)				
Mean group narcissism (4.09)				
Indirect effect	0.05	-0.88	0.99	.91
Direct effect	2.90	-1.23	7.61	.22
Total effect	2.95	-1.83	7.75	.22
-1 SD group narcissism (3.84)	-0.70	-2.21	0.47	.22
+1 SD group narcissism (4.34)	0.74	-0.30	2.11	.17

Control variables included in model. Number of samples for Quasi-Bayesian confidence intervals is 5000.

Advice network information was also collected on all respondents across all groups. Advice networks were measured via the roster method, and both ingoing ties were conceptually captured using the items “this person comes to me frequently to talk about work related matters.” Responses were measured on a seven-point Likert scale ranging from 1= “strongly disagree” to 7= “strongly agree.” As shown in Tables 4.12 and 4.13, there is no support for any of the hypothesized relationships in the advice network.

Friendship network information was collected on all respondents across all groups. Friendship networks were measured via the roster method (Marsden, 1990) using the single item, “this person is a friend; someone I would socialize with outside of BNI.” Responses were measured on a seven-point Likert scale ranging from 1= “strongly disagree” to 7= “strongly agree.” As shown in Tables 4.14 and 4.15, there is no support for any of the hypothesized relationships in the advice network.

Finally, the models were tested using peer-rated measures of the focal personality constructs. Despite the fact that I relied on identity-based measures of personality (i.e., self-rated measures) for this study, socioanalytic theory (Hogan, 2007) also suggests the importance of the reputational aspect of personality (i.e., peer perceptions) for understanding the impact of personality on behavior and outcomes, and prior research has often demonstrated superior predictive validities for peer-rated reputational measures of personality traits (e.g., Oh et al., 2011; Kluemper et al., 2015). In network analyses, reputation assessments of personality can be particularly salient given the focus on examining interactions that occur between members of the network and the potential impact of personality on network members and structure. As such, as a final robustness check I tested the models using peer-rated measures of the focal constructs. Peer-rated agreeableness was measured using a single-item reputational measure designed for network research contexts (Denissen et al., 2008). Narcissism was measured using an as yet unvalidated measure. Items included: "this person wants to be the center of attention," "this person expects others to do things for them," and "this person seeks status and admiration" and were measured on a 7-point Likert scale. Although this measure is still in development and testing, analysis showed acceptable levels of reliability (Cronbach's $\alpha = .87$). Nevertheless, these results should be considered exploratory in nature and requiring of further research.

ICC values for both peer-rated narcissism (ICC(1)= .53, ICC(2)= .92) and peer-rated agreeableness (ICC(1)= .41, ICC(2)= .87) are significant, suggesting adequate levels of group-level variance and agreement to support multilevel testing and aggregation to group-level measure in both Model 1 and Model 2 (i.e., allowing for testing of hypothesis 6). Thus, linear mixed-effect models and quasi-Bayesian approximation of mediation confidence intervals were used to test both models. As shown in Table 4.16, both peer-rated narcissism ($b = 0.05$, $p < .05$)

and agreeableness ($b = 0.04$, $p < .05$) are significantly and positively related to structural holes (supporting hypothesis 1). Further, structural holes are significantly and positively related to venture revenue in both Model 1 ($b = 18.00$, $p < .01$) and Model 2 ($b = 17.07$, $p < .01$). However, neither the multiplicative interaction term of individual- and group-level narcissism ($b = 0.02$, $p = .44$) nor the multiplicative interaction term of individual- and group-level agreeableness ($b = 0.06$, $p = .15$) entered in Step 2 is significant.

As shown in Table 4.17, the indirect effect of peer-rated narcissism onto venture revenue via structural holes is positive and significant ($b = 0.97$, 95% CI [0.06, 2.28], $p < .05$), supporting hypothesis 4a. This effect is significant and stronger at higher levels of group-level narcissism ($b = 1.07$, 95% CI [0.06, 2.49], $p < .05$), offering further support for hypotheses 4a and limited support for the notion that group-level narcissism moderates this indirect effect (i.e., hypothesis 5). The indirect effect of peer-rated agreeableness onto venture revenue via structural holes is also positive and significant ($b = 1.41$, 95% CI [0.17, 2.16], $p < .05$). This effect is weaker at lower levels of group-level agreeableness ($b = 1.00$, 95% CI [0.02, 2.51], $p < .05$) and stronger at higher levels of group-level agreeableness ($b = 1.79$, 95% CI [0.18, 4.16], $p < .05$).

Table 4.12 Linear Mixed Effects (Model 1) and Regression (Model 2) Results for Constraint and BNI Percent Venture Revenue in Advice Network (Post Hoc)

	Model 1						**Model 2**					
	Constraint[a]			**Revenue (BNI%)[b]**			**Constraint[c]**			**Revenue (BNI%)[d]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	0.41	0.53	0.78	0.29	32.20	0.01	0.22	0.20	1.11	-11.23	19.09	-0.59
NPI-13	0.00	0.08	0.00	-5.73	8.81	-0.65	0.01	0.08	0.14	-6.30	8.04	-0.78
Group NPI-13	-0.17	0.41	-0.41	-10.81	23.86	-0.45	--	--	--	--	--	--
Agreeableness	0.00	0.02	0.28	0.29	1.97	0.15	0.02	0.02	1.22	0.27	1.96	0.14
Constraint (SH)	--	--	--	-2.98	6.75	-0.44	--	--	--	-1.51	6.46	-0.23
Gender	-0.01	0.03	-0.39	3.84	3.01	1.28	-0.02	0.03	-0.73	4.30	2.99	1.43
Tenure in BNI group	0.00	0.00	0.99	1.63**	0.47	3.44	0.01	0.00	1.24	1.74**	0.47	3.71
Age	0.00*	0.00	2.33	-0.01	0.13	-0.04	0.00’	0.00	1.89	0.01	0.13	0.07
Extraversion	0.02	0.02	1.22	1.84	2.10	0.88	0.02	0.02	1.00	1.79	2.10	0.85
Openness to experience	0.01	0.02	0.45	1.62	2.22	0.73	-0.02	0.02	-0.87	1.37	2.21	0.62
Emotional stability	-0.01	0.01	-0.52	0.02	1.35	0.01	0.01	0.01	0.47	0.02	1.36	0.02
Conscientousness	0.01	0.01	0.63	1.15	1.51	0.76	0.01	0.02	0.40	0.87	1.49	0.58

SH refers to structural holes. *BNI%* refers to the percentage of respondent’s revenue that is directly attributable to BNI membership. Unstandardized coefficients from linear mixed effects model are reported, *a.* R^2=.03; *b*. R^2=.08; *c*. R^2=.05; *d*. R^2=.08

* $p < .05$; ** $p < .01$, ‘$p < .10$

Table 4.13 Indirect Effects onto BNI Percent Venture Revenue via Constraint in Advice Network (Post Hoc)

	Estimate	95% CI Lower	95% CI Upper	*P*-value
Narcissism (NPI-13)				
Mean group narcissism (1.24)				
Indirect effect	-0.04	-1.28	1.19	.96
Direct effect	-6.45	-24.83	11.65	.47
Total effect	-6.49	-2029	11.58	.47
-1 SD group narcissism (1.17)	-0.14	-2.29	1.73	.89
+1 SD group narcissism (1.31)	0.08	-1.42	1.75	.91
Agreeableness				
Mean group agreeableness (5.90)				
Indirect effect	-0.04	-0.64	0.64	.77
Direct effect	0.27	-3.60	4.14	.89
Total effect	0.23	-3.62	4.08	.91

Control variables included in model. Number of samples for Quasi-Bayesian confidence intervals (Model1) and non-parametric bootstrapping (Model 2) is 5000.

Table 4.14 Linear Mixed Effects (Model 1) and Regression (Model 2) Results for Constraint and BNI Percent Venture Revenue in Friendship Network (Post Hoc)

	Model 1						**Model 2**					
	Constraint[a]			**Revenue (BNI%)[b]**			**Constraint[c]**			**Revenue (BNI%)[d]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	0.33	0.44	0.74	2.75	32.62	0.08	0.17	0.18	0.91	-10.42	19.04	-0.55
NPI-13	0.01	0.07	0.16	-5.69	8.77	-0.65	0.00	0.08	-0.05	-6.35	8.02	-0.79
Group NPI-13	-0.13	0.35	-0.37	-12.24	24.23	-0.51	--	--	--	--	--	--
Agreeableness	0.02	0.02	1.14	0.48	1.97	0.24	0.03’	0.02	1.64	0.44	1.96	0.23
Constraint (SH)	--	--	--	-9.27	7.34	-1.26	--	--	--	-6.87	6.98	-0.98
Gender	-0.03	0.03	-1.05	3.59	3.00	1.19	-0.03*	0.03	-0.98	4.14	2.99	1.38
Tenure in BNI group	0.01*	0.00	2.27	1.68**	0.48	3.55	0.01*	0.00	2.21	1.80**	0.47	3.82
Age	0.00*	0.00	2.32	0.01	0.13	0.05	0.00’	0.00	1.87	0.02	0.13	0.16
Extraversion	0.03	0.02	1.87	2.11	2.11	1.00	0.04*	0.02	1.94	2.03	2.11	0.96
Openness to experience	0.00	0.02	-0.26	1.54	2.22	0.69	-0.02	0.02	-1.09	1.24	2.21	0.56
Emotional stability	-0.01	0.01	-0.51	0.00	1.35	0.00	0.00	0.01	0.22	0.03	1.36	0.02
Conscientousness	0.00	0.01	0.06	1.18	1.51	0.78	0.00	0.01	0.13	0.87	1.49	0.59

SH refers to structural holes. *BNI%* refers to the percentage of respondent’s revenue that is directly attributable to BNI membership. Unstandardized coefficients from linear mixed effects model are reported, *a.* R^2=.07; *b*. R^2=.08; *c*. R^2=.09; *d*. R^2=.09

* $p < .05$; ** $p < .01$, ‘$p < .10$

Table 4.15 Indirect Effects onto BNI Percent Venture Revenue via Constraint in Friendship Network (Post Hoc)

	Estimate	95% CI Lower	95% CI Upper	*P*-value
Narcissism (NPI-13)				
Mean group narcissism (1.24)				
Indirect effect	-0.28	-2.44	1.44	.75
Direct effect	-6.49	-24.06	10.89	.48
Total effect	-6.77	-24.84	10.64	.47
-1 SD group narcissism (1.17)	-0.86	-4.44	1.47	.54
+1 SD group narcissism (1.31)	0.36	-1.73	2.99	.73
Agreeableness				
Mean group agreeableness (5.90)				
Indirect effect	-0.21	-1.09	0.38	.29
Direct effect	0.44	-3.43	4.31	.82
Total effect	0.23	-3.62	4.08	.91

Control variables included in model. Number of samples for Quasi-Bayesian confidence intervals (Model1) and non-parametric bootstrapping (Model 2) is 5000.

Table 4.16 Linear Mixed Effects (Model 1) and Regression (Model 2) Results for Constraint and BNI Percent Venture Revenue Using Peer Measures (Post Hoc)

	Model 1						**Model 2**					
	Constraint[a]			**Revenue (BNI%)[b]**			**Constraint[c]**			**Revenue (BNI%)[d]**		
Variable	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***	***b***	***SE***	***t***
Intercept	-0.24	0.27	-0.89	-28.42	24.18	-1.18	0.02	0.38	0.05	-3.74	27.42	-0.14
Peer narcissism	0.05*	0.03	2.16	-0.75	2.64	-0.29	0.04*	0.02	2.01	0.18	1.92	0.09
Group peer narcissism	-0.01	0.05	-0.29	2.82	3.63	0.78	--	--	--	--	--	--
Peer agreeableness	0.04’	0.03	1.69	0.13	2.38	0.06	0.06*	0.03	2.02	1.47	2.96	0.50
Group peer agreeableness	--	--	--	--	--	--	-0.06	0.06	-0.98	-4.41	4.66	-0.95
Constraint (SH)	--	--	--	18.00**	6.34	2.84	--	--	--	17.07**	6.36	2.68
Gender	0.02	0.03	0.85	3.79	2.93	1.29	0.02	0.03	0.76	3.73	2.93	1.27
Tenure in BNI group	0.01*	0.00	2.34	1.47**	0.47	3.13	0.01*	0.00	2.41	1.51**	0.47	3.21
Age	0.00	0.00	0.86	0.00	0.13	-0.04	0.00	0.00	0.94	-0.01	0.13	-0.09
Extraversion	0.04	0.02	2.07	1.20	2.06	0.58	0.04*	0.02	2.11	1.09	2.06	0.53
Openness to experience	0.02	0.02	0.83	0.97	2.01	0.49	0.02	0.02	0.90	1.08	2.01	0.54
Emotional stability	-0.01	0.01	-0.60	0.00	1.34	0.00	-0.01	0.01	-0.66	0.02	1.34	0.01
Conscientousness	-0.01	0.01	-0.95	1.43	1.45	0.99	-0.01	0.01	-0.90	1.31	1.43	0.91

SH refers to structural holes. *BNI%* refers to the percentage of respondent’s revenue that is directly attributable to BNI membership. Unstandardized coefficients from linear mixed effects model are reported, *a.* R^2=.09; *b*. R^2=.11; *c*. R^2=.10; *d*. R^2=.11

* $p < .05$; ** $p < .01$, ‘$p < .10$

Table 4.17 Table 18. Indirect Effects onto BNI Percent Venture Revenue via Using Peer Measures (Post Hoc)

	Estimate	95% CI Lower	95% CI Upper	*P*-value
Peer Narcissism				
Mean group narcissism (2.68)				
Indirect effect	0.97	0.06	2.28	.03
Direct effect	-0.72	-5.85	4.36	.78
Total effect	0.25	-4.98	5.35	.92
-1 SD group narcissism (2.08)	0.53	-0.90	2.26	.47
+1 SD group narcissism (3.28)	1.07	0.06	2.49	.03
Peer Agreeableness				
Mean group agreeableness (5.98)				
Indirect effect	1.41	0.17	3.16	.02
Direct effect	0.68	-5.86	7.23	.84
Total effect	2.09	-4.48	8.64	.53
-1 SD group agreeableness (5.56)	1.00	0.02	2.51	.04
+1 SD group agreeableness (6.40)	1.79	0.18	4.16	.02

Control variables included in model. Number of samples for Quasi-Bayesian confidence intervals (Model1) and non-parametric bootstrapping (Model 2) is 5000.

CHAPTER V

DISCUSSION AND CONCLUSION

Discussion

This dissertation seeks to increase understanding on how dark and light personality traits of entrepreneurs interact with the structure and composition of social relationships to influence entrepreneurial performance. In doing so, it seeks answers to related questions including: “how do dark and light personality traits influence startup revenue?”, ”how do dark and light personality traits influence social structure?”, ”how does network structure affect the relationship between personality traits and venture success?”, “how is an entrepreneur’s social network positioning influenced by the characteristics of socially proximal others?”, and, “how does the composition of an entrepreneur’s network influence venture success?” These questions are important in building knowledge of conceptualizations of the entrepreneurial personality, the role of specific network structures in entrepreneurial performance, and emerging perspectives on the possible negative effects of social networks in entrepreneurship.

Despite mixed overall support for the hypothesized model, there are several key take-aways from the results. First, it should be noted that support for the relationship between narcissism and structural holes and the indirect effect of narcissism onto new venture revenue via structural holes was nearly significant (i.e., *p*- values of .06). Although these results do not fall under the strict cutoff for statistical significance at *p*-values less than .05, they nonetheless hint at a potentially interesting relationship between narcissism, structural holes, and venture revenue

(Meyer et al., 2017). Furthermore, based on the study's relatively small sample size (*N*=234), it is likely that the study is somewhat underpowered. Although sample size recommendations for multilevel studies tend to focus on the number of level-2 groups rather than level-1 observations (Maas & Hox, 2005), researchers have suggested that models testing numerous variables on multiple hypotheses with potentially small effect sizes are frequently underpowered (Cohen, 1992; Maxwell, 2004). Thus, it is likely that *p*-values of less than .05 would have been found if a) the study had been more appropriately powered, b) fewer control variables were included in the model, or c) fewer relationships had been examined. As a result, these relationships and their underlying mechanisms should continue to be explored in future research.

Nonetheless, the fact that the pattern of results remains consistent when Model 1 is tested with both self-reported and peer-reported measures (i.e., identity- and reputational-based measures) suggests a positive relationship between trait narcissism and structural hole occupancy. Although the results do not speak to behavioral intentions behind this pattern, they do support the notion that narcissistic entrepreneurs tend to move into structural hole positions in referral networks. The pattern of results also suggests that the brokerage, informational, and control benefits associated with structural hole occupancy all serve as potential mechanisms linking narcissism to new venture advantage. Although the post-hoc tests completed with the peer-measure of narcissism should be interpreted with caution, the consistent pattern of results suggests that these relationships should be probed further in future studies.

Another key finding from the study is that structural holes are consistently and strongly positively related to venture revenue across all measures used to test structural hole occupancy. Network structural holes create many benefits for the individuals that occupy them. Thus, findings that network constraint, effective network size, and network efficiency each have a

strong positive relationship with new venture revenue are not surprising. Nonetheless, these results pave the way for future research examining specific processes that link structural holes to entrepreneurial revenue and venture advantage. My theorizing suggests that entrepreneurs are likely to reap venture competitive advantage by taking advantage of the informational, control, and brokerage benefits of structural hole occupancy. Although beyond the scope of this research, future studies should seek to provide a greater understanding of *how* structural holes produce benefit in entrepreneurship and whether personality and other individual-level constructs influence the relationship between structural holes and competitive advantage. Future exploration of these relationships is especially important in light of growing understanding of how individual differences influence strategic orientation towards structural holes (Soda et al., 2018) and individuals' attitudes and behaviors surrounding brokering activities (Obstfeld, 2005; Obstfeld et al., 2014).

Results suggested that the interaction of individual narcissism and group-level narcissism did not significantly predict structural hole occupancy in the referral network. Despite this, there may is indication of a conditional indirect effect of individual narcissism onto new venture revenue via structural holes that is stronger and more likely to be significant at higher levels of group-level narcissism. Although the existence of this conditional indirect effect is interesting, it is not fully explained by either the theorizing or the empirical results of this study. Thus, these relationships need to be probed further in order to offer full understanding of why group narcissism seems to influence the indirect effect of narcissism onto venture revenue via network structures.

It is also interesting to note that the hypothesized relationships were not supported in either the advice or friendship networks collected from the same sample of entrepreneurs and

BNI groups. I chose to focus on referral network ties because of their clear utilitarian value to entrepreneurs. Because of the clarity of their utility, they offer a unique opportunity to capture narcissistic entrepreneurs' theorized utilitarian approach toward relationships. In light of this, there are numerous theoretical reasons that could explain the lack of supported results in advice and friendship networks. First, it is possible that narcissistic traits of self-importance, superiority over others, and grandiosity (Morf & Rhodewalt, 2001), preclude formation of network incoming advice ties. For example, because narcissistic entrepreneurs perceive themselves to be more important than others, it is unlikely that they make themselves available to offer advice to network others. Alternatively, narcissistic entrepreneurs may not perceive specific incidences of advice exchange with others to be important enough to be memorable; as a result, it is likely that advice exchange ties measured via sociometric survey tools are underreported by those with narcissistic traits. Similar explanations can explain the lack of supported results in friendship networks. Simply put, due to their utilitarian attitude towards relationships (Campbell & Campbell, 2009), it is very likely that narcissistic entrepreneurs do not have enough friends within network groups to support analysis. These conjectures could be explored in future research by examining relationships between identity and reputational measures of narcissism and additional network structures. For example, future research could examine the relationship between degree centrality among networks of varied content (Freeman, 1978; Vardaman et al., 2018; Vardaman et al, 2015), which measures each individual's number of direct network ties, and narcissism. Doing so would offer clarification on the linkages between trait narcissism among entrepreneurs and other key entrepreneurial resources such as the social capital transmitted through advice ties and the affective supported transmitted through friendship ties.

The results indicated no support for the Model 2 hypotheses involving the role of agreeableness. However, peer-rated agreeableness was positively related to structural holes. In addition, the indirect effect of agreeableness onto new venture revenue via structural holes was positive and significant; this effect was stronger at higher levels of group-level agreeableness and weaker at lower levels. These results suggest that agreeable entrepreneurs are likely to experience greater venture success via structural holes when they are embedded in networks with more, rather than fewer, other agreeable entrepreneurs. They also suggest that others' perceptions of entrepreneurs' agreeableness may play a more important role in creating venture advantage than one's own perceptions. Hence, when others perceive an entrepreneur to be agreeable, that entrepreneur is more likely to experience higher venture revenue via the effects of network structural hole occupancy, but when an entrepreneur perceives herself to be agreeable, those same relationships do not hold true.

Finally, one of the more interesting take-aways from this research is the finding that narcissistic entrepreneurs experience a greater venture advantage via structural holes when they are in network groups with many other narcissistic entrepreneurs. At the same time, entrepreneurs who are perceived by others to be agreeable experience a greater venture advantage via structural holes when they are in network groups with many other agreeable entrepreneurs. Thus, it is implicit that entrepreneurs perform better when they are in network groups with others who are similar to them, whether that similarity be on a prototypically positive or negative personality trait. Network research has long noted similarity attraction in tie formation, known as the homophily effect (e.g., Klein et al., 2004; McPherson et al., 2001), as well as the social influence of perceptions and attitudes onto proximal others (e.g., Ibarra & Andrews, 1993; Zagenczyk et al., 2010) but results have not found a connection between

interpersonal similarity and entrepreneurial performance. This finding should be explored further in several ways. First, there is an opportunity to explore if this notion holds true when examining other personality traits. There is also an opportunity to examine whether this similarity-performance link is relevant when examining other factors influencing individuals and groups (e.g., demographic, socio-economic, attitudinal). Furthermore, this linkage between similarity and performance should be examined longitudinally to explore how factors such as network churn (Vissa & Bhagavatula, 2012) and selection effects influence this finding.

Theoretical contributions

This dissertation makes four primary contributions to theory. First, it contributes to the study of the entrepreneurial personality by offering deeper understanding of how dark and light personality traits influence entrepreneurial performance via social interactions. Second, it contributes to knowledge of how specific network structures and characteristics can affect entrepreneurial outcomes. Third, it contributes to the field of entrepreneurship by examining how social comparison processes (Bassis, 1977; Davis, 1966; Festinger, 1954; Wood, 1989) influence venturing outcomes via social interactions. Finally, this dissertation contributes to the study of social networks by exploring how networks can contribute to both an advantage *and a disadvantage* in entrepreneurship.

In efforts to move away from unsuccessful efforts to develop a singular clearly defined entrepreneurial personality, research has begun to examine the theoretical complexity of both positive and negative effects of prototypically dark and light personality traits in entrepreneurship (Klotz & Neubaum, 2016; D. Miller, 2016). In order to further this stream of research, this study examined the mixed effects of one dark – narcissism – and one light – agreeableness – personality trait. These constructs were chosen, in part, because the field of

personality in entrepreneurship has relegated limited attention to study of the constructs of narcissism and agreeableness and because they conceptually represent extremes of prototypically dark and light personality traits. This study expands this line of research by providing evidence of how dark and light personality traits of entrepreneurs influence new ventures via social network structures. Thus, this dissertation builds on previous research by exploring structural mechanisms relating narcissism and agreeableness directly to venture performance outcomes, rather than performance antecedents or externalities (Mathieu & St-Jean, 2013; Smith & Webster, 2018).

Specifically, the findings of this study clarify the linkages between the dark trait of narcissism and entrepreneurial performance. Because narcissism is associated with poor relationships (Campbell et al., 2006; Judge, et al., 2006; Wiklund et al., 2018), it could be expected that narcissists might experience negative entrepreneurial outcomes due to poor social behaviors (Dubini & Aldrich, 1991). Contrary to these expectations, the findings herein suggest that narcissistic traits encourage strategic relational behaviors among entrepreneurs, facilitating construction of advantageous social ties via network structural holes. In turn, structural holes contribute significantly to venture advantage by providing entrepreneurs with increased access to information and resource flows and facilitating the brokerage of deals for resources. Thus, these findings not only somewhat support a linkage between narcissistic traits and entrepreneurial success, but also suggest that the successes of narcissistic entrepreneurs may be attributable, in part, to their uniquely utilitarian approach to building social relationships. The findings on the role of the light trait of agreeableness are not as clear. In contrast to the expectation that agreeable entrepreneurs may fail to get ahead in entrepreneurial networks due to a prioritization of relationships over personal utility (Komarraju et al., 2003), the limited results from this study

suggest that entrepreneurs who are perceived as agreeable by others may also reap venture advantage via structural hole occupancy in referral networks, especially when they are surrounded by other agreeable individuals. Thus, building perceptions of likability and willingness to get along with others may be an important part of entrepreneurial networking. These findings contribute to underdeveloped conceptualizations of the role of agreeableness in entrepreneurship, which should be probed further due to the unexpected nature of the results via the applications of perspectives such as impression management theory (Gardner & Martinko, 1988).

Second, this dissertation contributes to research on networks in entrepreneurship by clarifying how entrepreneurs leverage network structure to create advantage. The literature frequently suggests that networks provide a competitive advantage to nascent entrepreneurs (Dubini & Aldrich, 1991; Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010). Yet, the mechanisms underlying these advantages offered by networks have remained elusive. This study offers insight into this area via findings on the advantage that structural holes in referral networks offer to venture performance. Because the structural hole concept is theoretically based in perspectives of market competition (Burt, 1992), the examination of structural holes as an advantageous network mechanism for entrepreneurs is both empirically and theoretically salient. Thus, this study contributes to the understanding of how a precise network characteristic can link individual-level traits of entrepreneurs to venture-level performance. As such, this dissertation contributes to network theory by demonstrating how entrepreneurs are able to translate individual attributes into successful outcomes via networks.

Although limited empirical work has examined the effects of structural holes in entrepreneurship (Burt, 2019a, 2019b), they have often been examined as precursors of

economic development and legitimacy. Taking a different perspective, this study examines questions related to a) the traits of entrepreneurs who are more likely to take advantage of structural holes and b) how characteristics associated with the overall network affect the structural hole occupancy and outcomes. In doing so the study contributes to the application of the structural hole perspective in entrepreneurship research by suggesting that the utility of structural hole occupancy can be attributable, in part, to individual-level characteristics, opportunity, and the competitive social context.

Thirdly, this dissertation contributes to the field of entrepreneurship by exploring the role of social comparison processes in entrepreneurs' social network positioning and, in turn, venturing outcomes. Social comparison theory (Festinger, 1954) suggests that individuals rely on social comparisons with proximal or similar others to evaluate themselves when performance information is either unavailable or ambiguous. Due to the inherent ambiguity and uncertainty of entrepreneurial activities (Alvarez & Barney, 2007), social comparisons could play a significant role in psychological and cognitive processes of individual entrepreneurs. Despite this, studies examining entrepreneurship from a social comparison perspective are extremely limited. Although evidence supports the idea that entrepreneurs utilize social comparisons when making venture decisions (Martin-Sanchez et al., 2018), common factors on which individual entrepreneurs are likely to compare performance, including proxy measures, and the likely outcomes of these comparisons remain unknown. Thus, in efforts to fill this sizable gap, this dissertation examines how implicit social comparisons of personality traits with socially proximal entrepreneurs can influence performance outcomes via social network positioning. Results suggested that entrepreneurs experience venture advantage when embedded in networks with others with similar personality traits, thereby providing evidence that entrepreneurs rely on

implicit social comparisons to inform decisions on how to carry out entrepreneurship. Furthermore, this study also provides support for the notion that personality traits and other personal characteristics can serve as a proxy (Martin, 2000) through which individuals evaluate performance. Each of these findings provide significant contributions to the fields of both entrepreneurship and social comparison studies.

Finally, this dissertation contributes to the fields of entrepreneurship and social networks by suggesting that the extent to which individual entrepreneurs experience an entrepreneurial advantage *or disadvantage* may depend, to an extent, on the traits of others in the network. Most network studies of entrepreneurship view social networks as a resource from which entrepreneurs can draw social capital, affective support, and sources of funding (e.g., Hochberg et al., 2007; Leyden et al., 2014; Shu et al., 2018), and very few studies have examined the ways in which individual entrepreneurs may be disadvantaged by their networks (Burt, 2019a; Schott & Sedaghat, 2014). Yet, studies examining entrepreneurship in unique contexts (e.g., Kimmitt et al., 2020; Ring et al., 2010; Webb et al., 2013), suggest that social context may play a significant role in both how entrepreneurs carryout venturing and their likelihood of success. This study's results suggest that entrepreneurs may experience a greater advantage to venture revenue via structural holes when they are embedded in networks with others with traits similar to their own. These results also suggest that entrepreneurs would experience less of an advantage if they were embedded in networks with others with traits differing from their own. Thus, this dissertation begins to place boundary conditions around the positive influence of social context on entrepreneurship by identifying situations in which entrepreneurs may experience a heightened *or restricted* performance advantage depending on the traits of network others. Specifically, the results herein suggest that an entrepreneur's success may be partially attributable to

characteristics of others in the network in which they are embedded, with the implication that performance outcomes may have been different if they had been embedded in a different network. These findings offer insight into the ways in which individual entrepreneurs may be both advantaged and disadvantaged as a result of their networks.

Practical implications

These results also offer practical guidance to working entrepreneurs. Although the results herein specifically speak to mechanisms explaining how narcissistic entrepreneurs can create venture advantage despite a relational disadvantage, these findings can be similarly applied to additional groups with social differences. For example, neurodiverse entrepreneurs, including those with ADHD, bipolar disorder, or those on the autism spectrum, may experience social processes necessary in entrepreneurship differently (Johnson et al., 2018; Wiklund et al., 2016; Wiklund et al., 2018). Although social differences may hinder these individuals' abilities to "get along" in entrepreneurial networks, the results herein suggest this adversity may be overcome by engaging in purposeful "getting ahead" behaviors. While prior research has linked conditions such as ADHD to higher entrepreneurial selection, they have also established a negative link to venture performance (Rajah et al., 2021). Thus, this research may offer practical advice on how neurodiverse entrepreneurs can improve venture performance, thereby satisfying entrepreneurial ambitions. In doing so, this research contributes to practical perspectives which represent entrepreneurship as a pathway to economic independence for individuals experiencing difficulty in traditional workplace contexts (Wiklund et al., 2018; Wolfe et al., 2020).

Further, the results of this study offer guidance to entrepreneurs working in incubator or co-working spaces during nascent stages of entrepreneurship. Research indicates that entrepreneurs working in incubators are often in the early stages of venture development

characterized by high uncertainty and resource scarcity. As a result, these entrepreneurs may struggle to identify valuable network others as critical early resource providers (Busch & Barkema, 2020). The results herein suggest that nascent entrepreneurs embedded in incubators may improve early venture revenue and growth via structural hole occupancy despite these practical limitations to foster useful early-stage relationships. The consistent results showing a positive relationship between structural hole occupancy and venture revenue suggests that most entrepreneurs may experience venture advantage from structural hole occupancy. Thus, these findings may be extended to provide practical guidance on networking behaviors to early-stage entrepreneurs working in group contexts.

Finally, the results herein speak to how entrepreneurs can leverage "getting along" behaviors to strategically "get ahead." Results indicating that entrepreneurs experienced performance advantage via structural holes when they were perceived to be agreeable by others – but not when self-identifying as agreeable – suggest that entrepreneurs can utilize relationships to increase performance by purposefully engaging in agreeable behaviors (e.g., altruism, caring for others) only when it is strategically necessary to do so, even if these traits are not inherent.

Limitations and future research

This dissertation is subject to some limitations. The study relies on a self-reported measure of revenue (i.e., percentage of revenue directly attributable to BNI group membership). Although this type of revenue measure has been previously implemented in studies of networking groups (Pollack et al., 2015a; Pollack et al., 2015b), utility could be gained by testing these relationships with alternative measures of entrepreneurial performance (e.g., return on investment, percentage of sales growth). Alternatively, similar models could be tested using complementary measures of venture success, such as venture longevity, increase in venture size,

attention from external funding partners (e.g., venture capitalist firms or angel investors), or an initial public offering of shares.

Another constraint of the study involves the somewhat limited number of groups in which respondents are nested. While some research suggests that multilevel studies should ideally be comprised of 50 or more level-2 groups, research indicates that both regression coefficients and variance estimations are accurate at lower numbers of groups (Maas & Hox, 2005). Numerous multilevel studies have produced meaningful results using fewer than 50 groups (e.g., Chen et al., 2015; Ding et al., 2015; Kang et al., 2016). In addition, high ICC(1) and ICC(2) values for many of this study's focal variables suggest the presence of a meaningful group-level effect (LeBreton & Senter, 2008). However, it is possible that the insignificant ICC values for the self-reported measure of agreeableness could be attributed to the somewhat limited number of groups represented within the dataset. Thus, future work should seek to replicate my results using both larger datasets as well as data on entrepreneurs in different social contexts. For example, because entrepreneurship research has established differences between student and professional entrepreneurs (Politis et al., 2010), future research could examine these hypothesized relationships using a sample of student entrepreneurs nested in university incubators nationwide. Replications across cultures could also be useful as research suggests culture may impact the ways in which organizational phenomena take place (Allen & Vardaman, 2021; Allen & Vardaman, 2017; Vardaman & Montague-Mfuni, 2021).

Another limitation of the study is the single time period in which the data were collected. Although common method bias (Podsakoff et al., 2003) is minimized because network data was constructed from responses provided by a variety of respondents across groups and contexts, the data cannot speak to how these relationships change over time. As a result, future research

should seek to explore how narcissism, agreeableness, and other personality traits influence the ways that entrepreneurs build, maintain, and abandon social ties over time to sustain competitive advantage. Although results from this study are mixed, there is some evidence thar narcissistic entrepreneurs build social ties differently from their peers. Thus, future research should take network churn – or the pattern, composition, and number of changes in individuals' personal networks over time (Sasovova et al., 2010) – into account when probing these results to explore how narcissistic entrepreneurs may strategically cultivate their networks over time as startups develop through different stages of entrepreneurship.

In addition, this study is somewhat limited in that it explores and tests *the extent to which* narcissistic entrepreneurs are more likely to occupy structural holes in networks, but not *why* or *how* they are more likely to do so. Thus, a shortcoming of this study is that it does not seek to uncover the mechanisms linking narcissistic traits to structural hole occupancy. As a result, the question of whether narcissists intentionally seek to occupy structural holes or occupy them as an innate result of their aversive social behaviors is left unanswered. Although these questions are beyond the scope of this study, future research should seek to provide further insight. In particular, an opportunity exists to explore this question via the application of theories of entrepreneurship. For example, it may be possible that narcissists are more alert (Gaglio & Katz, 2001; Kirzner, 1973) to opportunities to occupy structural holes in referral networks because they are less distracted by social niceties and performances than their less narcissistic peers. In addition, it is possible that narcissistic entrepreneurs are more willing to accept social risks (Knight 1921) necessary when building structural hole positions in networks because of their general disregard for maintaining positive and lasting social relationships and their characteristic overconfidence. Alternatively, it may be that narcissistic entrepreneurs move into structural hole

positions in referral networks unconsciously as a result of their higher entrepreneurial orientation (Wales, Patel, & Lumpkin, 2013) and desire for social visibility.

A final limitation of this study is that it is unable to probe the conditional indirect effect of individual narcissism onto new venture revenue via structural holes at varying levels of group-level narcissism. Although the interaction term of individual- and group-level narcissism did not significantly predict structural holes, there was evidence of a stronger and significant indirect effect at high levels of group-level narcissism. However, this effect remains unexplored. There are two possible reasons for this. The first is that the quasi-proxy mean measure of narcissism used to operationalize group-level narcissism is faulty. This likelihood is evinced by the notion that a single individual within a BNI group who rates either very high or very low on trait narcissism could skew the group average, particularly in smaller BNI groups. Thus, future research should seek to further probe these relationships using measures and tests that more directly operationalize the level of narcissism in the group, as a whole. For example, the quadratic assignment procedure multiple regression (MR-QAP) method of network analysis could facilitate testing how similarity in narcissism scores of network proximal others influences tie formation within a network (Borgatti, Everett, & Johnson, 2013). However, predicting the likelihood that a specific network structure (i.e., structural holes) will form based on the influence of exogenous variables is notoriously difficult (Snijders et al., 2006). The most promising methods for doing so include exponential random graph models (Lusher, Koskinen, & Robbins, 2013) and stochastic actor-oriented models (Snijders, van de Bunt, & Steglich, 2010), both of which allow for the modeling of specific structural tendencies taking into account complex patterns of dependency of observations. Although utilization of these methods is beyond the scope of this study, future research should seek to model the likelihood of structural

holes forming based on entrepreneur's narcissism and agreeableness scores using these methods of social network analysis.

Alternatively, it is possible that the hypothesized mechanism does not underlie this observed conditional indirect effect. This dissertation theorized that narcissistic entrepreneurs would increase their reliance on getting ahead behaviors as they perform implicit social comparisons to other socially proximal narcissistic entrepreneurs, resulting in greater structural hole occupancy and venture revenue. However, drawing on the study's results, it is possible that alternative mechanisms explain why the positive indirect effect of individual narcissism onto venture revenue via structural holes seems to strengthen as narcissism in the group increases. This possibility is especially likely considering the notion that narcissists may be less likely to notice or consider social cues from others, and thus may not consider whether socially proximal others work to get along or get ahead when making entrepreneurial decisions. Future research should seek to explore alternative mechanisms explaining this unexplained conditional indirect effect. For example, one alternative plausible explanation could be that narcissistic entrepreneurs are more adept at gaining advantageous referrals through their networks due to characteristic utilitarian attitudes towards relationships; as a result, narcissistic entrepreneurs in groups of many narcissistic entrepreneurs are able to exchange and receive more valuable customer referral information than narcissistic entrepreneurs in groups with fewer narcissistic others. Furthermore, compelling arguments could be made that a) narcissistic entrepreneurs' attempts to get ahead may be dampened as the number of narcissistic others in the group increases and the competition to occupy structural holes becomes greater and that b) narcissistic entrepreneurs will be driven to engage in greater getting ahead behaviors as they observe many non-narcissistic others, who they may perceive to be less capable. While these assertions are not supported by the results of the

study, the existence of such plausible explanations suggest that future research should revisit the theoretical foundations underlying the observed influence of group narcissism.

Concluding remarks

The study sought to explore how the interactive effects of entrepreneur's dark and light personality traits, social network positioning, and personality traits of socially proximal others influence venture performance via revenue. This work proposed several hypotheses using social network, social comparison, and socioanalytic theories. These hypotheses were tested using a psychometric and sociometric dataset of 234 individual entrepreneurs nested within 24 distinct network groups. Results suggested that narcissistic entrepreneurs experience a venture advantage via structural hole occupancy, and that this advantage is greater when socially proximal others are also narcissistic. At the same time, entrepreneurs who are perceived as being agreeable – but not those who self-identify as having agreeable traits – also experience a venture advantage via structural occupancy, and this effect is greater when they are surrounded by socially proximal others who are also perceived to be agreeable. Study results offered significant theoretical contributions to fields of entrepreneurial personality, entrepreneurial outcomes, social networks, and social comparison processes as well as practical contributions to working entrepreneurs.

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