

MODERATING AND MEDIATING EFFECTS OF SHARED LEADERSHIP ON THE
RELATIONSHIP BETWEEN ENTREPRENEURIAL TEAM DIVERSITY AND
PERFORMANCE

by

WENCANG ZHOU

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Donald Vredenburg, Ph.D.

Date

Chair of Examining Committee

Joseph Weintrop, Ph.D.

Date

Executive Officer

Edward G. Rogoff, Ph.D.

Ronald Neath, Ph.D.
Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK

Abstract

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Adviser: Professor Donald Vredenburg

In entrepreneurship research there is growing interest in the diversity and complexity of entrepreneurial teams because of their potential to shape new business growth (Wright and Vanaelst, 2009). However, a significant research gap exists regarding how entrepreneurial teams form and how team composition relates to entrepreneurial team performance. A review of the entrepreneurial team literature indicates three specific research needs. First, research on the relationship between entrepreneurial team informational diversity and performance remains inconsistent and inconclusive, and requires more empirical research. Moreover, while studies have examined the link between informational team diversity and entrepreneurial team performance and found inconsistent results, researchers have failed to investigate the conditions under which such diversity might benefit performance. Second, a need exists for research on the relationship between personality diversity and entrepreneurial team performance. Third, while some studies have found relationships between different types of diversity and performance, researchers have failed to investigate the fundamental intervening processes. Therefore the specific mechanisms through which team heterogeneity may influence entrepreneurial team performance remain unexplored.

This study aimed to address these research needs. One of its purposes is to examine the effect of informational diversity on entrepreneurial team performance. Informational diversity, consisting of differences in knowledge bases and perspectives that members bring to an entrepreneurial team, was hypothesized to positively relate to entrepreneurial team performance. Another purpose of this study was to assess the relationship between personality diversity and entrepreneurial team performance. Halfhill et al. (2005) differentiated task oriented personality traits (conscientiousness and openness to experience) from relationship oriented ones (agreeableness, extraversion, and emotional stability). The present hypotheses suggested that diversity on task oriented personality traits negatively relate to entrepreneurial team performance while diversity on relationship oriented personality traits relate positively. The third purpose of this study is to test the moderation and mediation effects of shared leadership in the relationship between entrepreneurial team diversity and team performance. As a process variable, shared leadership across multiple team members could determine how team diversity affects entrepreneurial team performance.

The sample consisted of 200 entrepreneurial teams in a technology incubator founded in 2009 by the local government of Hangzhou, Zhejiang province of China. This study used a cross-sectional questionnaire design. Four dimensions measured informational diversity: functional specialty, educational specialty, educational level, and managerial skills. Team members' Big-5 personality traits were measured by the Chinese Version of NEO-Five Factor Inventory (NEO-FFI) (Costa and McCrae, 1992). Personality diversity consisted of the variance of scores on each personality trait in each team. Entrepreneurial team performance was assessed by a 16-item scale developed by Pearce and Sims (2002). Team leadership density, measured by Carson et al.'s (2007) scale, assessed shared leadership. Hypotheses were tested with hierarchical linear modeling.

Three major findings emerged from this study. First, functional specialty diversity can improve entrepreneurial team performance. This skill diversity can improve entrepreneurial team

performance only when leadership is shared among team members. Second, team members' personalities matter; the effects of personality on entrepreneurial team diversity differ across the Big-5 personality traits. Mean scores on openness to experience, conscientiousness, and extraversion positively relate to entrepreneurial team performance. However, mean score on agreeableness is negatively associated to entrepreneurial team performance. Diversity on conscientiousness relates negatively to entrepreneurial team performance, while diversity on agreeableness and diversity on emotional stability appear positively related to entrepreneurial team performance. Third, shared leadership mediates the conscientious diversity and performance link as well as the extraversion diversity and performance link.

These findings advance research in entrepreneurship, groups and teams, and shared leadership. While further analysis is required to base knowledge on more empirical evidence, the present study also provides practical implications for entrepreneurs regarding team composition.

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CHAPTER 1

INTRODUCTION

Entrepreneurship is a major source of employment, economic growth, and innovation (Kuratko, 2003). According to the Global Entrepreneurship Monitor (GEM) 2010 report (Kelley, Bosma, and Amorós, 2011), around 250 million people between 18 and 64 years old around the world were involved in early stage entrepreneurial activity as defined by GEM. In addition, around 63 million out of those 250 million expected to hire at least five employees over the next five years, illustrating the contribution of entrepreneurship to job growth across the world. Entrepreneurship is generally characterized as an economic battle of a “lonely hero” (Cooney and Bygrave, 1997), despite the fact that group entrepreneurship has been well documented since the beginning of the industrial revolution (Lechler, 2001). In addition, traditional entrepreneurship literature that examined entrepreneurship characteristics usually paid attention to individual characteristics (Brockhaus, 1976, 1980; Low and MacMillan, 1988) rather than team-level variables (Davidson and Wikland, 2001). However, entrepreneurial teams are more common than the literature suggests (Lechler, 2001). For example, entrepreneurial teams were founders of 70% of the firms in the high-tech industries (Cooper, Dunkelberg, Woo, and Dennis, 1990). Furthermore, firms founded by teams are on average more successful than firms founded by individuals (Cooper and Bruno, 1977; Mayer, Heinzl, and Müller, 1989).

There has been considerable debate as to what the term “entrepreneurial team” exactly means. According to Kamm, Shuman, Seeger and Nurick (1990), entrepreneurial team refers to two or more individuals who jointly establish a firm in which they have a financial interest. This definition was then broadened by Gartner, Shaver, Gatewood, and Katz (1994) to cover those individuals who have direct influence on a firm’s strategic choice. Ensley, Carland, and Carland

(1998) combined the two definitions and defined entrepreneurial teams to fulfill three criteria: (1) they jointly establish a firm; (2) they have a financial interest; and (3) they have a direct influence on the strategic choice of the firm.

According to the Global Entrepreneurship Monitor Report (Bosma and Levie, 2010), the creation of a new venture is a process with three stages - conception, firm birth and persistence. The firm birth stage is also referred to as the early stage of new venture development, which begins when one or more persons starts to commit time and resources to founding a new firm and ends at 3.5 years. The present study will focus on teams at this early stage of entrepreneurship. The reason for examining early stage entrepreneurial teams is that prior work on new ventures has shown that founders and the founding team shape a firm's initial strategies, structures, actions, and performance (Boeker, 1988) and eventually have a lasting imprint on the venture's future development. Early stage entrepreneurial teams confront business and technological uncertainty and also have to solve managerial and legal problems. Therefore, understanding the factors that contribute to the functioning of early stage entrepreneurial teams should help us better understand how entrepreneurial teams perform.

In the literature, entrepreneurial team performance has been measured at both firm level (Brush & Vanderwerf, 1992; Chandler & Lyon, 2001; Ensley & Hmieleski, 2005) and team level (Chowdhury, 2005; Foo, 2011). Entrepreneurial team performance has also been measured with both objective and subjective measures. Clearly, entrepreneurial team performance is a multi-dimensional concept (Lechler, 2001). Studies adopting one single measure of performance cannot capture the whole picture of entrepreneurial teams. However, it is problematic when a cross-level design is used in which individual-level characteristics are used to explain firm-level performance (Davidsson, 2007). Individual level characteristics, such as personality traits, should

relate more strongly to individual-level performance (Rauch & Frese, 2007); team level variables should relate more strongly to team-level performance.

Importance of Entrepreneurial Teams

Entrepreneurship is critical to the development and well-being of society by creating new jobs, driving innovation, speeding up structural changes, introducing new competition, and contributing indirectly to productivity (Bosma and Levie, 2010). In the past three centuries, we have witnessed dramatic evolutionary and revolutionary changes in technology. In this change, entrepreneurship has often played a starting role. The ability to identify opportunities and utilize available resources to develop suitable products and markets has been a significant contributory factor to the rise of today's developed economies. Despite the importance of entrepreneurship to society, existing studies reveal a high failure rate among entrepreneurial ventures. For example, Song, Podoyntsyna, Van Der Bij, and Halman (2008) found that the five-year survival rate for companies with more than five full-time employees was only 21.9%. Given the high failure rate of new ventures, it is of social importance to identify factors leading to the success and failure of these ventures. In the entrepreneurship literature, the factors examined include market opportunity, resources including financial resources, firm age, size and type, R&D, and entrepreneurs' individual characteristics (c.f. Song et al. (2008) for a review). However, given the prevalence of entrepreneurial teams, it is important to examine entrepreneurial team level characteristics to understand new venture performance.

According to the evolutionary perspective (Boeker, 1988), the configuration of the founding team shapes subsequent entrepreneurial activities, strategies, and entrepreneurial performance. In research on teams, an important focus has been the study of team composition, especially in terms of team diversity. However, research on team diversity remains inconclusive

because of the contradictory findings regarding effects of demographic diversity on team performance (Williams and O'Reilly, 1998). On the one hand, heterogeneous teams are supposed to be more effective in solving complex, non-routine problems because of the existence of diversity in perceptions, skills, abilities and knowledge that exists in a heterogeneous team (Stasser, Stewart, & Wittenbaum, 1995). On the other hand, heterogeneity might also produce relationship conflicts among team members resulting in poor performance (Amason and Sapienza, 1997). Therefore, it is empirically important to examine the effects of diversity on entrepreneurial team performance.

The issue of entrepreneurial team composition is also of practical importance. The creation of a new entrepreneurial team entails decisions regarding who will participate. Thus, the study of the success factors contributing to entrepreneurial performance can benefit entrepreneurs by providing implications regarding team member selection. As we better understand the relationship between team composition and entrepreneurial team performance, founders can learn how to avoid some of the pitfalls in team selection that lead to inadequate skills and competencies. As we better understand the mechanism through which diversity relates to team performance, we can provide clear guidelines for practitioners about how to set up effective entrepreneurial teams and how to function as an effective team.

Research Purposes

In a review of entrepreneurship literature, Kamm et al. (1990) concluded that there was a significant gap in the literature regarding how entrepreneurial teams are formed and how team composition is related to the development of new ventures. Thereafter, although still relatively limited, an emerging body of literature has started focusing on team level issues to examine the factors that contribute to venture success (Ensley, Pearson, & Amason, 2002). Especially, there

is growing interest in the diversity and complexity of entrepreneurial teams because of their potential to shape new business growth (Wright and Vanaelst, 2009). However, research on team diversity remains inconclusive since this line of research provides contradictory results. For example, Ensley and Hmieleski (2005) found a positive relationship between new venture top management team skill and educational diversity and sales growth. But such team diversity was also found to negatively relate to performance (Amason, Shrader, and Tompson, 2006). Given the importance of the possible relationships between team composition variables and team performance, the first research question that this study aimed to answer was:

Research question 1: What is the relationship between entrepreneurial team diversity and performance?

In the literature, three types of team diversity were studied, including social-category diversity (or demographic diversity), informational diversity, and personality diversity (Jehn, Northcraft, and Neale, 1999). Social-category diversity refers to differences in demographic membership, including race, gender, and ethnicity. Informational diversity refers to differences in knowledge and perspectives that team members bring into the team. Personality diversity presents when team members differ in personality traits.

A purpose of this study was to examine the effect of informational diversity on entrepreneurial team performance. Informational diversity refers to differences in knowledge bases and perspectives that members bring to an entrepreneurial team. The literature review presented in Chapter 2 indicates that most of the research on entrepreneurial team diversity focused on demographic diversity and informational diversity and found inconsistent and contradictory results. For example, Ensley et al. (1998) found a negative association between entrepreneurial team diversity in highest degree major and new venture performance, while

Aspelund, Berg-Utby, and Skjevdal (2005) found that heterogeneity in functional experience of the founding team could reduce the likelihood of firm failure. Therefore, this study aimed to examine the effect of informational diversity, which likely arises as a function of differences in education background, training, and work experiences.

Another purpose of this study was to examine the effect of personality diversity on entrepreneurial team performance. Given that research has failed to demonstrate a consistent and significant relationship between demographic heterogeneity and team performance (Webber & Donahue, 2001), researchers have focused on the effects of deep level composition variables (e.g. personality traits, attitudes, and values) and suggested that although demographic differences may be important, deep-level composition variables can have a stronger influence on team performance (Harrison, Price, Gavin, & Florey, 2002). Our review showed that studies that examine the effect of team personality diversity on entrepreneurial team performance are scarce. This study tried to examine the effect of personality diversity on entrepreneurial team performance.

Research question 2: What is the effect of shared leadership on entrepreneurial team performance?

According to Hackman's (1987) I-P-O (input-process-output) model, entrepreneurial team performance is influenced not only by team composition but also by interaction among team members. Some researchers have hypothesized about power and leadership of the entrepreneurial leader as possible variables to clarify the team process (Mintzberg and Waters, 1985). In the literature, leadership is considered crucial for enabling both individual and team performance (Zaccaro, Rittman, & Marks, 2001). For example, Katzenbach (1997) argued that a top management team achieves real team performance when they learn to shift the leader role

back and forth depending on the changing needs and demands and draw on the leadership ability of each of its members in different situations. However, most research on leadership in teams has focused only on the leadership behaviors of the individual team leader, while overlooking the leadership behavior provided by team members. This shared leadership, defined as the distribution of leadership influence across multiple team members, is supposed to give organizations competitive advantages because the widely shared influential acts increase members' commitment and utilize the diverse information team members bring into the team. However, the recent literature on shared leadership and team effectiveness found somewhat mixed results. A few studies have found support for the effect of shared leadership on team performance (e.g. Pearce and Sims, 2002), but other studies have not found such evidence (e.g. Neubert, 1999). Therefore, the current study aimed to examine the relationship between shared leadership and entrepreneurial team performance.

Research question 3: What is the role of shared leadership in the relationship between team diversity and entrepreneurial team performance?

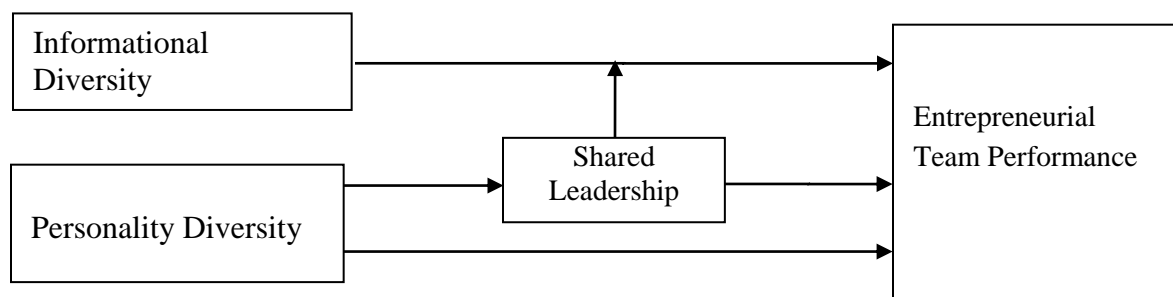
According to the present review of the entrepreneurial team literature, two research gaps exist. The first gap is that while studies have looked into the link between informational team diversity and entrepreneurial team performance and found only inconsistent results, researchers have failed to investigate the conditions under which such diversity might benefit performance. Another gap in this line of research is that while some of these studies had successfully linked team diversity to performance, researchers have failed to investigate the more fundamental intervening process (Smith et al., 1994). Therefore, a causal gap exists between entrepreneurial team diversity and performance, and the specific mechanisms through which team heterogeneity may influence entrepreneurial team performance remain generally unexplored. As a process

variable, shared leadership across multiple team members could determine how team diversity affects entrepreneurial team performance. However, this potential intervening effect of shared leadership has not been empirically investigated yet.

A purpose of this study was to test the mediation role of shared leadership in the relationship between personality diversity and team performance. In the leadership literature, personality traits appear related to individual leadership behavior (Judge, Bono, Ilies & Gerhardt, 2002). However, the issue of whether personality diversity among team members affects shared leadership behavior has not been empirically examined. The present study helps us to understand the process through which the personality diversity affected entrepreneurial team performance.

Another purpose of the study was to explore the moderation effect of shared leadership in the relationship between informational diversity and team performance. In the entrepreneurial team research, two underlying assumptions exist. One is that heterogeneous teams are more effective in solving complex issues, and the other is that new business creation implies solving complex problems under time pressure (Wright and Vanaelst, 2009). However, to benefit from the diversity an entrepreneurial team has, the team must develop appropriate process to utilize such resources. Therefore, the exploration of the moderation effect of shared leadership will help us to reconcile the inconsistent findings regarding the effect of informational diversity in the literature. Figure 1 presents the theoretical model of the present study.

Figure 1: Theoretical Model



Contribution

The findings of this study contribute to several research literatures. First, the study contributes to the entrepreneurship literature by filling two research gaps. One gap is the lack of empirical studies on the functioning of personality team diversity on entrepreneurial team performance. In the entrepreneurship literature, many studies, adopting the upper echelons theory (Hambrick & Mason, 1984), have looked into the potential effects of top management team demographic diversity, such as age, gender, race, tenure, and functional experience diversity, but ignored the effect of team personality diversity. Therefore, this study contributes to our understanding of the potential performance effect of personality diversity on entrepreneurial teams. The other gap is the lack of studies focusing on process variables to interpret the performance effect of team diversity. Studies of top management teams relying on upper echelons theory have been criticized for overlooking the “black-box” between diversity and performance (Lawrence, 1997). This study contributes to the literature by opening this “black-box” with a process variable, shared leadership.

Second, the study contributes to the shared leadership literature. The study contributes to the shared leadership literature by providing empirical evidence regarding the performance effect on entrepreneurial teams. Given the importance of shared leadership in work teams, it is desirable to identify conditions that could support shared leadership. In the literature, some antecedent conditions for shared leadership have been studied, including the overall team environment (shared purpose, social support, and voice) and team coaching (Carson, Tesluk, & Marrone, 2007). However, the team members’ dispositional factors, such as personality traits, have not been examined in the literature. In the leadership literature, personality traits have been shown to be related to individual leadership emergence and effectiveness (Judge et al., 2002).

However, whether the personality diversity among team members would affect team shared leadership remains unexplored. The findings of this study contribute to our understanding of the emergence process of shared leadership.

Third, this study contributes to groups and teams research in several aspects. The effect of diversity has been widely studied in the groups and teams research. However, most of the studies were conducted in the laboratory rather than in the field. Bell's (2007) meta-analysis shows that the effect of diversity would differ between lab studies and field studies and requested more future research in field settings. Moreover, there are inconsistent empirical results regarding the performance effect of team diversity. On the one hand, diversity creates value and benefit for team outcomes because diversity brings a broader range of knowledge, expertise, and perspectives (Cox, Lobel, & McLeod, 1991). On the other hand, diversity also creates poor social integration, cohesion, and thus poor performance for teams (Pfeffer, 1983). By examining the role of shared leadership, this study contributes to the literature by providing more empirical evidence regarding the performance effect of team diversity. Therefore, this study provided empirical evidence regarding the diversity effects in the context of entrepreneurial teams. Moreover, by examining the moderating and mediating effects of shared leadership, this study can contribute to the understanding of team functioning beyond entrepreneurial teams, such as innovation teams, new product teams, and teams in which tasks are interdependent, multiple skills and expertise are required, and member interactions are high.

Besides potential theoretical contributions, the study also has important implications for practitioners. First, the study provides entrepreneurs with implications regarding team member selection. The study aims to address an important issue, how important is it to build an entrepreneurial team with informational diversity or/and personality diversity? The findings will

help entrepreneurial team founders learn how to avoid some of the pitfalls in team selection that lead to inadequate skills and competencies. Secondly, the study also provides entrepreneurs with implications regarding how to function as an effective diverse team. The current study has important implications for team leaders regarding the development of shared leadership across team members to bolster the performance effect of team diversity.

Organization of the Study

This study is structured as follows. A thorough literature review is conducted in chapter two, the model and hypotheses are proposed in chapter three, and the study design is presented in chapter four. Chapter five reports the result of statistical analysis of the data and chapter six presents the findings, recommendations, contributions, limitations and summary.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study is to answer three research questions: (1) What is the relationship between entrepreneurial team diversity and performance? (2) What is the effect of shared leadership on entrepreneurial team performance? (3) What is the role of shared leadership in the relationship between team diversity and entrepreneurial team performance? To answer the three research questions, a literature review was performed in three sections. Section 1 reviewed the definition of entrepreneurial teams and the measurement of entrepreneurial team performance in the literature. Section 2 reviewed the empirical studies that examined the relationship between entrepreneurial team diversity and performance. Section 3 reviewed the literature regarding shared leadership and its relationship with team performance.

Entrepreneurial Teams and Performance

Definition of Entrepreneurial Teams

There has been a growing interest in studying entrepreneurial teams since Gartner et al. (1994) made the argument that the entrepreneur in entrepreneurship is typically plural, instead of singular. The argument that the entrepreneurial activity of establishing and growing a new business is more often taken by entrepreneurial teams rather than a solo entrepreneur is now generally acknowledged (Reich, 1987; Kamm et al., 1990; Gartner et al., 1994; Ensley et al., 1998; Lechler, 2001). For example, Hunsdiek (1987) reported that new high-tech ventures in Germany had a median of 2.2 entrepreneurs. In another study, Cooper et al. (1990) found that entrepreneurial teams were founders of 70% of the firms in the high-tech industries in the United States. In addition, firms founded by teams are on average more successful than firms founded

by individuals (Cooper & Bruno, 1977; Mayer et al., 1989) because entrepreneurial teams seem better suited to deal with the volatilities and uncertainties associated with new businesses that demand flexibility and complexity in decision making processes (Wright & Vanaelst, 2009).

However, considerable debate exists as to what the term “entrepreneurial team” exactly means. According to Kamm et al. (1990), entrepreneurial team refers to two or more individuals who jointly establish a firm in which they have a financial interest. This definition was then broadened by Gartner et al. (1994) to cover those individuals who have direct influence on a firm’s strategic choice. Ensley et al. (1998) combined the two definitions and defined entrepreneurial teams to fulfill three criteria: (1) they jointly establish a firm; (2) they have a financial interest; and (3) they have a direct influence on the strategic choice of the firm. According to this definition, entrepreneurial teams are distinct from top management teams (TMTs). TMTs are made up of people who hold executive titles, regardless of when they join the new business. Although there is overlap between an entrepreneurial team and a TMT when all founders hold executive titles, the two types of teams are conceptually distinct (Wright & Vanaelst, 2009).

Entrepreneurial Team Performance

While performance is a widely studied dependent variable in research on entrepreneurship, the operationalization of performance varies across studies. At first, researchers used both firm level performance measures and team level performance measures. Firm level measures included key milestones (e.g. getting venture capital and IPO), organizational survival, growth, profitability, and product innovativeness. Instead of directly measuring financial performance, Beckman, Burton, and O’Reilly (2007) chose the ability of obtaining venture capital funding and going public (IPO) as venture performance measures since

they represent the most significant milestones in the life of a young start-up firm. Organizational death or business survival (Aspelund et al., 2005) was also chosen as a dependent variable in the entrepreneurship literature. Growth is often cited as the most important objective of new ventures (Brush & Vanderwerf, 1992) and it is measured as sales growth (Chandler & Lyon, 2001; Ensley et al., 1998), revenue growth (Ensley & Hmieleski, 2005; Hmieleski & Ensley, 2007), and employment growth (Hmieleski & Ensley, 2007; Ensley et al., 1998). Another firm level performance measure is financial or accounting measurement, measured as cash flow (Ensley & Hmieleski, 2005), revenues (Ensley et al., 1998) and 24-month holding period returns (HPRs) (Kroll, Walters, & Le, 2007). Productivity and product innovativeness were also used in some studies (Henneke & Lüthje, 2007; Davis, Aldrich, & Longest, 2009).

Team level performance measures included team effectiveness, team productivity, and team stability. How members evaluate their team may be important for entrepreneurial teams because if members evaluate their team negatively, the team may dissolve (Foo, 2011). Therefore, self-rated team effectiveness (Chowdhury, 2005; Foo, Sin, & Yiong, 2006; Foo, 2011) and team productivity (Davis et al., 2009) were used as team level performance measures in some studies. Another team level performance measure is team stability, usually measured as team member entry and exit (Ucbasaran, Lockett, Wright, & Westhead, 2003; Hellerstedt, Aldrich, & Wiklund, 2007). According to Ucbasaran et al. (2003), team member entry or exit related to the total amount of human capital within an entrepreneurial team.

Both objective and subjective measures of performance have been used in entrepreneurial team research. For new ventures, objective performance measures, such as sales, revenues, and profits, may not be relevant because the team is unlikely to have substantial sales while the main concern is to establish the new venture, team membership, identity and commitment (Carter,

Gartner, & Reynolds, 1996). Therefore, many studies used subjective measures of entrepreneurial team performance. For example, Chowdhury (2005) used members' ratings of the team's knowledge of tasks, quality of work, quantity of work, initiative, interpersonal skills, and overall performance. Foo et al. (2006) used member ratings of team effectiveness. Ensley and Hmieleski (2005) defined team effectiveness as the degree of collective efficacy toward achieving the team's goals.

Clearly, entrepreneurial team performance is a multi-dimensional concept. Studies adopting one single measure of performance cannot capture the whole picture of entrepreneurial teams. Three general gaps exist regarding performance measures in entrepreneurship research. First, studies using firm level measures of performance usually adopted a cross-level design in which individual or team level characteristics were used to explain firm-level performance (Davidsson, 2007). However, team level variables should relate more strongly to team level performance because firm level performance is influenced by a broad range of factors, many of which cannot be influenced by the individual's or team's characteristics, such as interest rates or regulations. Second, while objective measures, such as financial and accounting measures of performance, were preferred by some researchers, subjective measures may be more appropriate when the focus of the study is to examine how well the entrepreneurial teams are functioning. Studies adopting objective performance measures have been built consistently around a model of profit-seeking individuals (e.g., Heaton & Lucas, 2000; Cagetti & De Nardi, 2006). However, in many entrepreneurship studies, the drive of profits is often a secondary concern (Ruef, 2010). A more typical motivation for entrepreneurs is that they do not like working for others (Shane, 2008). Therefore, subjective measures, such as perceived performance by entrepreneurs, are as important as objective measures. Third, implications of independent variables might vary across

different performance measures. For instance, personality or value differences among entrepreneurial team members may have a stronger relationship with team level performance than with firm level performance. Therefore, team effectiveness, a subjective team level performance measure, is more appropriate for this study. The next section reviews the literature on entrepreneurial team diversity and different performance measures.

Team Diversity and Entrepreneurial Team Performance

Types of Diversity and Theoretical Perspectives

Researchers have used different approaches to categorize team diversity. One approach to diversity is a two-factor approach in which diversity is defined in terms of two categories of differences. For example, Jackson, May, and Whitney (1995) categorized diversity into visible differences, such as race, ethnicity, age, and gender, and nonvisible differences, including education, skills and abilities, values and attitudes, and personality differences. Another example is to distinguish between surface-level and deep-level diversity (Harrison et al., 2002; Harrison, Price, & Bell, 1998; Bell, 2007). Surface-level diversity refers to demographic differences among team members, while deep-level diversity includes differences in attitudes, beliefs, values and personalities. One problem with the two-factor approaches is that diversity is measured with a limited set of variables, and often operationalized as only one focal characteristic (Mannix & Neale, 2005). Another problem is that it is hard to categorize some individual characteristic variables into either of the two categories. For example, diversity in educational background might be surface level or deep level diversity. To overcome this problem, the current study adopted Jehn, Northcraft, and Neale's (1999) multifaceted approach which utilized several clusters of categories: social-category diversity (or demographic diversity), informational

diversity, and personality diversity. Social-category diversity refers to differences in demographic membership, including race, gender, and ethnicity. Informational diversity refers to differences in knowledge and perspectives that team members bring into the team. Informational diversity likely comes from team members' differences in education, training, and working experiences. Personality or value diversity presents when team members differ in personality traits or personal values. Due to the nature of the sample used by the current study, value diversity is not expected to exist among team members. The sample is 200 entrepreneurial teams in a university entrepreneurial park in China. Most of the team members are from eastern China and are recently graduated from a local university; therefore they are supposed to have very similar cultural values. Thus the current study will focus on personality diversity rather than value diversity. Informational diversity and personality diversity would generate different perceptions and views of team tasks and goals, and benefit entrepreneurial team performance.

In the area of group research, researchers have used a number of theories to explain the performance effects of and relations among different types of team diversity. The four most common theoretical bases for explaining these performance effects are social categorization, similarity/attraction, information and decision making theory, and upper echelons theory. Table 1 presents the prediction of the diversity – performance relationship by different theories.

According to social categorization theory (Tajfel, 1982), team members are assumed to have a desire to maintain a high level of self-esteem by a process of social comparison with others in terms of age, race, status and other attributes. This process permits the individual to assume a positive self-identity, maximize intra-group or intergroup distinctions and to perceive others as less attractive (Kramer, 1991). In heterogeneous teams, effects of self-categorization have been shown to lead to decreased satisfaction, increased turnover, lowered levels of

cohesiveness, reduced communication and cooperation, and higher level of conflict (Crocker & Major, 1989; Martin & Shanrahan, 1983; Moreland, 1985; Stephan & Stephan, 1985; Triandis, Kurowski, & Gelfand, 1994). Empirical studies adopting social categorization theory typically confirmed the negative effects of demographic diversity on team process and outcomes.

Table 1

Diversity – Performance Relations by Different Theories

	Demographic Diversity	Informational Diversity	Personality Diversity
Social categorization theory	Negative	Negative	NA
Similarity/attraction theory	Negative	Negative	Negative
Information/decision making theory	Positive	Positive	Positive
Upper echelons theory	Positive (Turbulent Environment) Negative (Stable Environment)		NA

Another theoretical framework used in studies of diversity is the similarity/attraction theory (Berscheid & Walster, 1978; Byrne, 1971). According to this perspective, similarity on attributes ranging from values to demographic variables increases interpersonal attraction and liking (Byrne, Clore, & Worchel, 1966). Individuals will avoid communicating with those they dislike (Rosenbaum, 1986). Therefore, according to these studies heterogeneous groups are less effective because dissimilarity among group members often resulted in group process and performance loss, including less positive attitudes, less frequent communication, and a higher likelihood of turnover (Jehn et al., 1997).

A third theoretical framework explores how information and decision making can be affected by group composition (Gruenfeld, Mannix, & Neale, 1996; Wittenbaum & Stasser, 1996). According to this perspective, members in a diverse team may bring in more information

and different perspectives. This added information may enhance team performance when tasks can benefit from multiple perspectives, generating benefits such as innovation or complex problem solving (Williams & O'Reilly, 1998). Moreover, diversity also improves the breadth of cognitive ability important for problem solving and decision making. Thus, this line of research has focused on the utility of informational diversity and as well as demographic diversity and personality diversity (Wittenbaum & Stasser, 1996).

Empirical studies adopting this perspective also help us better understand the relations among different types of diversity. Demographic diversity merely brings people together with diverse backgrounds but does not ensure relevant team-level cognitive diversity (Chowdhury, 2005). Any diversity of perspectives may arise from factors other than demographic attributes, such as informational diversity or personality diversity. Second, people with similar demographic backgrounds may differ in their thinking styles as well (Abraham, 1997). Therefore a team lacking demographic diversity may still have access to a diverse scope of cognitive attributes.

Upper echelons theory (Hambrick & Mason, 1984) specifically explored the effect of top management team (TMT) diversity on various organizational outcomes. This theory mainly focuses on TMT diversity on observable characteristics (demographic and informational) and poses that TMT diversity benefits performance in turbulent environments rather than in stable environments. Despite the large number of studies on TMT heterogeneity, empirical research has yielded inconsistent results (Cannella, Park, & Lee, 2008). For the present paper, the TMT research has limited utility for entrepreneurial research due to the conceptual distinction between entrepreneurial and top management teams (Wright & Vanaelst, 2009). However, the literature

reviewed in the current study includes empirical studies in TMT literature as long as the sample used by the empirical study was entrepreneurial teams.

To reconcile the mixed findings regarding performance and team diversity, researchers have begun to search for explanatory mediators or moderators. For example, Joshi and Roh (2009) examined the role of contextual factors in team diversity research, such as industry setting, team interdependence, and team type. Results showed that the positive performance effect of task-oriented diversity increased as team tasks, goals, and outcomes became more interdependent, while the negative effects of relations-oriented diversity were strengthened in long-term teams. Bell et al. (2011) explored how different conceptualizations of diversity (i.e., separation, variety, disparity) would modify the demographic diversity and team performance link. Their meta-analysis showed that functional background diversity had a small positive relationship with general team performance as well as with team creativity and innovation, and the relationship was strongest for design and product development teams. Educational background diversity was related to team creativity and innovation and to team performance for top management teams. Race and sex variety diversity had small negative relationships with team performance, whereas age diversity was unrelated to team performance regardless of diversity conceptualization.

In summary, different theoretical perspectives and inconsistent empirical results within the team diversity literature offer different implications for entrepreneurial teams. A need exists to undertake a thorough review of team diversity and entrepreneurial team research to develop an integrated understanding of the relationship between types of team diversity and entrepreneurial team performance at both firm and team levels. To review the literature on entrepreneurial team diversity, I undertook an electronic search of PsycInfo, ABI/Inform, EBSCOhost and ProQuest

Digital Dissertations, using keyword combinations of *diversity*, or variants such as heterogeneity, and *entrepreneurial team or founding team or top management team or new venture*. The database searches were supplemented with manual searches in relevant journals. Twenty empirical studies were identified. Table 2 shows the empirical studies on entrepreneurial team diversity. Table 3 summarizes the results of the empirical studies reviewed regarding the relationship between entrepreneurial team diversity and entrepreneurial team performance.

Table 2

Studies included in the literature review on entrepreneurial team diversity

Study	IV (Diversity) ^a	Mediator Or Moderator	DV (Performance) ^b
Amason et al. (2006)	Age Education level Major Functional	Venture novelty	Sales growth Profitability Market Performance
Aspelund et al. (2005)	Functional		Organizational death
Beckman et al. (2007)	Functional Affiliation		Ability to attract venture capital and complete IPO
Chandler & Lyon (2001)	expertise demographic		Sales growth
Chowdhury(2005)	Age Gender Functional		Team effectiveness
Davis et al. (2009)	Racial Gender Age Experience		Team productivity
Ensley & Hmieleski (2005)	general heterogeneity	Type of Business	Growth Net cash flow
Ensley et al. (1998)	Skill Degree Major Functional		Revenues Sales growth Revenues Profitability
Foo (2011)	Race Age Task Experience		Team effectiveness
Foo et al. (2005)	Age Gender Employment status Education Level Major	Team size	Business Ideas
Foo et al. (2006)	Educational	Social Integration	Team Viability Satisfaction
Goethner & Stuetzer (2009)	Functional		Firm survival Growth

Table 2 (continued)

Studies included in the literature review on entrepreneurial team diversity

Study	IV (Diversity) ^a	Mediator Or Moderator	DV (Performance) ^b
Hellerstedt et al. (2007)	Age Sex Education Country of birth Industry experience		Team Stability
Henneke & Luthje (2007)	Educational	Environmental Scanning and Strategic Openness	Product Innovativeness
Hmieleski & Ensley (2007)	General heterogeneity	Environmental Dynamism and Leadership Behavior	Venture performance
Kroll & Le (2007)	Ownership dispersion		Post IPO performance
Li (2008)	Functional	Firm Growth	Pre-IPO management team restructuring
Ucbasaran et al. (2003)	Functional Experience		Member entry Member exit

Note: a. Independent variables – type of diversity; b. Dependent variables – type of entrepreneurial team performance.

Table 3

Summary of Entrepreneurial Studies by Type of Diversity and Type of Performance Measure

Diversity Type	Firm Level Performance				Team Level Performance			Effect		
	Key milestones	Organizational survival	Growth	Profitability	Product innovativeness	Team effectiveness	Team productivity		Team stability	
General demographic			1						+	
									--	
									No	
Age			1			1			+	
						1		1	--	
Gender				2		1			No	
								1	+	
							1		--	
Race						2			No	
									+	
						1		1	--	
							1		No	
General informational			1						+	
			2						--	
			1			1			No	
Education level			1			1			+	
			1	1					--	
			1	2				1	No	
Education background			1			1			+	
			1					1	--	
			1	3	1	2			No	
Functional	1	1					1	1	+	
		1	1					1	--	
Experience	1		4	3		1		1	No	
	2								+	
						2	2	2	--	
Skills			2	1					No	
Personality									Except a case study, no empirical study was found in the literature.	

+: positive effect; -: negative effect; No: no effect

Demographic Diversity and Entrepreneurial Team Performance

Researchers typically relied on two perspectives to explain the advantages and disadvantages of demographic diversity. Some studies drew upon social categorization theory and hypothesized that demographic heterogeneity was problematic because it disrupted group processes and produced relationship conflict, conflict over team members' personal preferences or disagreements about interpersonal interactions, typically about non-work issues such as gossip, social events, or religious preferences (Jehn, 1995, 1997). Other studies held optimistic views of demographic diversity and proposed that it would benefit entrepreneurial team performance because it brought together people with different perspectives, cognitive styles, skills and abilities. The review of empirical studies (Table 2) showed inconsistent and inconclusive results regarding the relationship between demographic diversity and entrepreneurial team performance.

Age diversity. Overall, six empirical studies examined the relationship between age diversity and entrepreneurial team performance. One study showed a positive relationship with team effectiveness (Foo, 2011). Three studies discovered negative relationships with growth (Amason et al., 2006), team effectiveness (Foo, Wong, & Ong, 2005), and team stability (Hellerstedt et al., 2007). Four studies, however, failed to demonstrate significant results. Although team members of similar age were more likely to share common experience and thus could facilitate better communication among team members (Zenger & Lawrence, 1989), no conclusion could be drawn regarding the relationship between age diversity and entrepreneurial team performance due to inconsistent results of empirical studies.

Gender diversity. Four studies explored the relationship between gender diversity and entrepreneurial team performance. One study showed a positive relationship with team stability

(Hellerstedt et al., 2007), one study displayed a negative relationship with team productivity (Davis et al., 2009), while another two studies discovered non-significant results (Chowdhury, 2005; Foo et al., 2005). Due to the limited number of studies and inconsistent results, no conclusion could be made regarding entrepreneurial team gender diversity.

Racial diversity. Only three studies examined the racial composition and entrepreneurial team performance. One possible reason for this lack of research on race diversity is that very little racial diversity exists in entrepreneurial teams (Williams & O'Reilly, 1998). Two of the three studies failed to find significant relationships between race diversity and entrepreneurial team productivity (Davis et al., 2009; Hellerstedt et al., 2007). Foo (2011), however, found that race diversity was negatively related to self-rated entrepreneurial team effectiveness. No conclusion could be drawn due to the inconsistent results.

Dispersion of ownership. Since each of the entrepreneurial team members holds partial ownership of new ventures, the dispersion of ownership among team members may have an effect on a team's effectiveness. Kroll et al. (2007) examined this effect in a study of entrepreneurial firms completing IPOs in 1996 and 1997 and found that ownership dispersion among team members was not significantly related to firms' post-IPO performance.

In sum, empirical studies demonstrated inconsistent and thus inconclusive results regarding relationships between demographic diversity and entrepreneurial team performance. One possible explanation for the inconsistent results is that less demographic diversity is expected to exist in entrepreneurial teams because individuals prefer to form entrepreneurial teams with friends with similar demographic backgrounds (Ruef, 2010). Another possible explanation may be that demographic variables are not reliable proxies for informational or psychological dimensions of team diversity. Hambrick and Mason (1984) were already aware of

this issue and acknowledged that ‘observable demographic factors simply do not provide a reliable portrayal of a person’s make up.’ Therefore, while more empirical studies are needed to examine the relationship between demographic diversity and entrepreneurial team performance, studies of entrepreneurial teams should also focus directly on informational and personality diversity instead of relying on diversity in demographic characteristics only. As for the current study, the sample was 200 entrepreneurial teams of which team members were similar in terms of demographic characteristics, such as age and race. Hence, the current study focused on the informational diversity and personality diversity of the entrepreneurial teams rather than demographic diversity.

Informational Diversity and Entrepreneurial Team Performance

Studies proposing positive effects of demographic diversity on entrepreneurial team performance often employed demographic diversity as a proxy for informational diversity or cognitive diversity of a team. However, demographic diversity merely brings people together with diverse backgrounds but does not necessarily ensure the existence of diversity of perspectives and ideas (Chowdhury, 2005). Therefore, many studies examined directly the effects of different types of informational diversity and entrepreneurial team performance. Studies in this line of research generally took the perspective of information processing and decision making and hypothesized positive effects of informational diversity. The empirical results, however, are quite inconsistent and therefore inconclusive. For example, using two independent samples, Ensley and Hmieleski (2005) examined the effect of general diversity in terms of education, industry experience, functional experience and skills on new ventures’ performance, measured by net cash flow. Positive effect was found in the nationally

representative, independent start-ups sample, including high-technology new ventures with at least 20% growth over a three-year period. However, the study failed to demonstrate significant relationships between informational diversity and entrepreneurial team performance in the university based start-ups sample, including university based high-technology start-ups that were located in either a university incubator or technology park in the southeastern section of the United States. However, general informational diversity was found to be negatively related to revenue growth and employment growth (Hmieleski & Ensley, 2007). The effect of informational diversity also differed according to how diversity and performance were measured.

Educational level diversity. Educational levels within the team could be viewed as sources of informational diversity, resulting in task conflicts - disagreements about task content, goals, and task processes (Jehn, 1994; Jehn, Chadwick, & Thatcher, 1997) - because informational diversity may bring members together with different perceptions about tasks and goals. In addition, if people are more likely to form ties with others of similar educational level, diversity in terms of educational level could broaden the networks associated with entrepreneurial team members (Hellerstedt et al., 2007). Two studies showed a positive association of educational level diversity with external evaluation of ideas of teams in a business plan competition (Foo et al., 2005) and new venture sales growth (Amason et al., 2006). However, Ensley et al. (1998) found that educational level diversity was negatively related to sales growth. In other three studies, no significant results were supported. Therefore, the association between educational level diversity and entrepreneurial team performance remains inconclusive.

Education background diversity. Educational background diversity could provide entrepreneurial teams with a wide array of procedural and instrumental knowledge. For example,

technology related educational knowledge may provide the foundation for innovation, while education in general management can enable entrepreneurial teams to integrate market opportunities with technological innovation (Henneke & Lüthje, 2007). Empirical results, however, do not support this expected positive effect. Only two studies showed positive effects of educational diversity on team variability (Foo et al., 2006) and new venture sales growth (Amason et al., 2006). Another two studies, however, discovered negative relationships between education background diversity and new venture revenues (Ensley et al., 2006), and team stability (Hellerstedt et al., 2007). Six empirical studies failed to demonstrate significant results regarding association of educational diversity with entrepreneurial team innovativeness (Henneke & Lüthje, 2007), member satisfaction (Foo et al., 2006), external evaluation of business ideas (Foo et al., 2005), and profitability and market performance (Amason et al., 2006). Overall, the usually hypothesized positive association between educational background diversity and entrepreneurial team performance has not been supported by empirical studies.

Functional diversity. Because diverse teams are expected to contain more relevant expertise than homogeneous groups, teams with diverse functional backgrounds should be more effective in making decisions (Jackson, 1992). From this perspective, increased functional diversity should be positively associated with entrepreneurial team performance. Four empirical studies provided support for this argument (Beckman et al., 2007; Aspelund et al., 2005; Ucbasaran et al., 2003; Davis et al., 2009). The empirical evidence, however, did not show consistent support for this prediction. Three studies revealed that functional diversity was negatively related to new venture revenues (Ensley et al., 1998), firm survival (Goethner & Stuetzer, 2009) and team stability (Goethner & Stuetzer, 2009). In another 5 studies, non-significant effects were found between functional diversity and entrepreneurial team

performance in terms of team effectiveness (Chowdhury, 2005; Foo, 2011), new venture sales growth, profitability and market performance (Amason et al., 2006; Chandler & Lyon, 2001; Ensley et al., 1998). Thus, empirical findings regarding relationships between functional diversity and entrepreneurial team performance remain divergent and inconsistent.

Experience diversity. Entrepreneurial team members' prior industry experience may be associated with assets as well as liabilities (Starr, Bygrave, & Tercanli, 1993). On the one hand, industry experience can considerably enhance a member's human capital, and the diversity of prior experience among team members may enhance the human capital of the team (Ucbasaran et al., 2003). Human capital is significantly associated with an increased level of productivity (Becker, 1975), and therefore, experience diversity should increase firm level entrepreneurial team performance. This positive relationship was supported by a Beckman et al. (2007) study. The authors examined the effect of affiliation diversity, a special type of experience diversity, on new ventures' probability of reaching critical entrepreneurial firm milestones and found that entrepreneurial teams with diverse prior company affiliations received venture capital financing and went public at higher rates than homogenous entrepreneurial teams.

On the other hand, diversity of prior experience may create conflict between experienced and inexperienced team members, and therefore hurt team cohesion and effectiveness. Five empirical studies provided consistent support for a negative relationship between experience diversity and team level entrepreneurial team performance, including team effectiveness (Foo et al., 2005; Foo, 2011), team stability (Hellerstedt et al., 2007; Ucbasaran et al., 2003) and team productivity (Davis et al., 2009). In conclusion, empirical evidence provided support that associations between experience diversity and entrepreneurial team performance varied depending on whether performance was measured at team level or firm level.

Although informational diversity has often been assumed to be beneficial for firm level and team level entrepreneurial team performance, empirical evidence is inconsistent and therefore inconclusive. The possible explanation for the conflicting results of entrepreneurial teams' informational diversity research might be the 'black box' problem (Lawrence, 1997), whereby researchers assume that some team process variables (e.g., team conflict or trust) are expected to explain the relationship between entrepreneurial team diversity and team performance. However, these process variables are not directly measured (Nielsen, 2010). Therefore, research is needed to identify the conditions under which informational diversity benefits entrepreneurial team performance.

Personality Diversity and Entrepreneurial Team Performance

The personality approach provided the impetus for substantial research in the 1960s and 1970s, with research on need for achievement (McClelland, 1961), the most frequently studied personality characteristic, peaking in the 1980s (Rauch & Frese, 2007). Earlier research phase focused on identifying the personality characteristics of entrepreneurs and investigated the differences between entrepreneurs and non-entrepreneurs, as well as the difference between successful and non-successful entrepreneurs. The personality approach of entrepreneurship research gained new momentum in the 1990s, reflecting the increasing acceptance of the unifying five-factor model (FFM or Big Five) of personality and meta-analysis as a technique for aggregating and generalizing the results of many single studies (Zhao & Seibert, 2006; Zhao, Seibert, & Lumpkin, 2010).

Personality and individual entrepreneurial performance. Since the mid-1980s, the Five Factor Model has been found to be a parsimonious yet comprehensive taxonomy of personality. General agreement among personality theorists has developed around the use of the terms

extraversion, emotional stability, agreeableness, conscientiousness, and openness to experience (Costa & McCrae, 1992; Judge et al., 1999; Mount & Barrick, 1998; Hogan, 1991). Each personality dimension describes a broad domain of psychological functioning that is composed from a set of more specific facets. First, extraversion is primarily associated with the extent to which people are assertive, dominant, energetic, active, talkative, and enthusiastic (Costa & McCrae, 1992). Research has shown that extraverted people are more likely to take on enterprising occupations (Costa, McCrae, & Holland, 1984). Second, individuals lower in emotional stability tend to experience a number of negative emotions including depression, irritability, and anxiety (Costa & McCrae, 1992). The work environment, workload, work-family conflict and financial risk of starting and running a new business can produce high physical and psychological stress. Therefore, emotional volatility and worrying are expected to be obstacles for entrepreneurial intention and success (Vesper, 1990). Third, agreeableness assesses one's interpersonal orientation. Individuals high in agreeableness tend to be courteous, forgiving, trusting, altruistic and flexible in dealing with others. Highly agreeable individual has cooperative values and a preference for positive interpersonal relationships. As such, it is plausible that a level of agreeableness is necessary to receive the required support to get a new venture started. Individuals high in conscientiousness tend to be hardworking, achievement-oriented, and persevering in the pursuit of goal accomplishment. Fourth, conscientiousness is regarded as a broad personality dimension that is composed of two primary facets: achievement motivation and dependability (Mount & Barrick, 1998). In the entrepreneurship literature, achievement motivation has been widely studied. McClelland (1961) proposed that a high need for achievement would drive an individual to become an entrepreneur. Stewart and Roth (2004) also reported that entrepreneurs have higher achievement motivation than do managers in their

meta-analyses. Fifth, individuals high in openness to experience are characterized as being intellectually curious, and open to new ideas and experiences. Individuals high on Openness can be described as creative, innovative, imaginative, reflective, and untraditional, narrow in interests (McCrae, 1987). Entrepreneurs are supposed to be creative and to create something larger than themselves (Engle, Mah, & Sadri, 1997). Founding a new business is likely to require the entrepreneur to explore new idea. As such, the attributes of intelligence, broad-mindedness, and originality are salient for starting a new venture.

The effect of Big Five predispositions on entrepreneurial success was evidenced by the recent meta-analysis by Zhao et al. (2010). Conscientiousness ($\rho = 0.19$), openness to experience ($\rho = 0.21$), emotional stability ($\rho = 0.18$), and extraversion ($\rho = 0.09$) are each positively related to entrepreneurial firm performance.

Personality diversity and entrepreneurial team performance. In group research, the relationship between personality diversity and team performance has been confirmed by meta-analytic reviews (Stewart, 2006; Bell, 2007). Bell's (2007) meta-analysis indicated that personality diversity in terms of conscientiousness, agreeableness, or openness experience was negatively related to team performance in work settings. Personality diversity has been widely examined in group research (c.f. Barrick et al., 1998; Bell, 2007). For example, Barrick et al. (1998) revealed that less diversity in conscientiousness was related to better team performance and diversity in agreeableness was negatively related to team cohesion and workload sharing. Mohammed and Angell (2003) reported that higher variability on agreeableness and emotional stability resulted in lower oral presentation performance for student teams.

However, studies exploring implications of personality diversity in entrepreneurial teams remain limited (Simsek, Heavey, & Veiga, 2010). No empirical studies were found to examine

the relationship between personality diversity and entrepreneurial team performance. In a case study by York, McCarthy, and Darnold (2009), the authors observed business students working in cross-disciplinary project teams in the technology commercialization process and found that personality diversity seems to increase conflict in teams and is quite difficult to overcome even over time.

The scarcity of studies exploring personality diversity in entrepreneurial teams is in large part because of the obstacles to studying entrepreneurs' personality. Although the impact of several facets of CEO personality has been examined in empirical studies, such as self-esteem and locus of control (Miller, 1983; Miller & Toulouse, 1986), emotional stability and hubris (Hayward & Hambrick, 1997), overconfidence (Simon & Houghton, 2003), and narcissism (Chatterjee & Hambrick, 2007), often the researchers have had to rely upon secondary data (e.g., analysis of published biographies) rather than directly measure these personality traits. Since studies using demographic variables as proxies for psychological dimensions of entrepreneurial team diversity have failed to find significant relationship between team diversity and entrepreneurial team performance and given the fact the personality diversity has been shown important to team performance (Bell, 2007), it is desirable to examine the relationship between personality diversity and entrepreneurial team performance.

Moderators and Mediators

Given the evidence that diversity can have both positive and negative effects on entrepreneurial team performance, we need to understand further under what conditions and through what mechanisms different types of diversity can affect performance.

Six entrepreneurial studies examined possible moderators that would affect the relationship between diversity and entrepreneurial team performance. Moderator variables at the

firm level included firm growth (Li, 2008), new venture novelty (Amason et al., 2006), and environmental dynamism (Hmieleski & Ensley, 2007). Li (2008) found that pre-IPO firm growth moderated the negative relationship between top management team functional diversity and new ventures' pre-IPO management team restructuring. Amason et al. (2006) examined the moderation effect of venture novelty on the relationship between top management team diversity and new venture performance and discovered that different levels of novelty represent different challenges for new ventures. Highly novel ventures create value by introducing new products and services, while less novel ventures create value by improving existing operations. Therefore, the fit between entrepreneurial team composition and the requirements of its strategy should affect performance (Chaganti & Sambharya, 1987). Results showed that new ventures in the early stages of highly novel strategies benefit from homogeneity within entrepreneurial teams. Hmieleski and Ensley (2007) found that the value of entrepreneurial team informational diversity was context dependent; it depended on environmental dynamism and entrepreneur leadership behavior. In dynamic environments more diverse entrepreneurial teams performed better when led by individuals high in directive leadership behavior and low in empowering leadership behavior. In stable environments, the inverse relationships were found. Some team level characteristics, such as entrepreneur leadership behavior (Hmieleski & Ensley, 2007) and team size (Foo et al., 2005), moderated the link between diversity and entrepreneurial team performance. Foo et al. (2005) found that the positive relationship between diversity of education background and evaluation of business ideas is greater for larger teams than for smaller teams.

Studies examining the mechanism through which diversity affects entrepreneurial team performance remain limited. In the group research literature, task and emotional conflicts among team members were supposed to mediate the relationship between team diversity and team

performance (Williams & O'Reilly, 1998). Such a relationship, however, may not hold for entrepreneurial teams, because such teams have some choice of which members to admit, and there is little reason to expect a high degree of emotional conflict among team members (Foo, 2011). Individuals prefer to form entrepreneurial teams with friends with and less likely to involve an individual who have emotional conflict with others into the team (Ruef, 2010). Only one entrepreneurship study was found to examine the mediation process. Henneke and Lüthje (2007) suggested that team heterogeneity was indirectly related to product innovativeness through the quality of the intervening strategic planning processes because a diverse entrepreneurial team was supposed to allow for comprehensively assessing the market as well as the technological and financial environment of a new venture.

Shared Leadership and Team Performance

Applying Hackman's (1987) I-P-O (input-process-output) model fosters recognition that entrepreneurial team performance is influenced not only by team composition but also by interaction among team members, such as power and leadership processes (Mintzberg & Waters, 1985). A team leader's behavior has been shown crucial for both individual and team performance (Zaccaro et al., 2001). Although most research on leadership in teams has focused only on the leadership behaviors of the individual team leader, some researchers found that teams performed more effectively when most or all the individuals demonstrate leadership behaviors (Carson et al., 2007), referred to as shared leadership.

Definition of shared leadership

Gibb (1954) argued for the importance of leadership being shared among team members. He challenged the traditional assumption that leadership should reside in a single individual,

formulated the notion of distributed leadership, and stated that leadership was probably best conceived as a group quality which must be carried out by the group. Katz and Kahn (1978) also suggested that shared goals and shared leadership can give organizations competitive advantage because the widely shared influential acts increase members' commitment.

Pearce and Conger (2003) described shared team leadership as a dynamic, interactive influence process among individuals in work groups in which the objective is to lead one another to achieve group goals. Similarly, Carson et al., (2007) conceptualized shared leadership as an emergent team property that results from the distribution of leadership influence across multiple team members, which represents a condition of mutual influence embedded in the interactions among team members that can significantly improve team and organizational performance.

Some definitions of shared leadership highlight the roles of individuals within a team. Barry (1991) defined shared leadership as a collection of roles and behaviors that can be split, shared, and rotated with multiple leaders existing within a team at any given time. Avolio and Bass (1995) also suggested that the two basic leadership behaviors, initiating structure and individualized consideration, can be exhibited collectively by team members.

Other definitions emphasize the capacity of team, conceptualized as an integrated unit to provide leadership (Ensley, Hmieleski, & Pearce, 2006). For instance, to assess this form of shared leadership, individuals answer questions such as "My team members provide a clear vision of who and what our team is" (Pearce & Sims, 2002).

All these definitions distinguish shared leadership from vertical leadership, in which a single person imparts direction and influences individuals (Pearce & Sims, 2002). Shared leadership is also different from other constructs, such as team self-management and team empowerment. In self-management teams, members have greater responsibility for setting goals,

monitoring processes, and making decisions than do teams with a single manager. Self-managing teams, however, do not necessarily result in leadership influence being widely shared in a team (Carson et al., 2007), because an individual member may emerge as team leader of a self-managing team without leadership influence being shared. Shared leadership differs from team empowerment, a motivational construct defined as the collective experience of heightened levels of task motivation as a result of high levels of task meaningfulness, autonomy, impact and potency (Kirkman & Rosen, 1997). Team empowerment may facilitate the development of shared leadership, but a team experiencing a high level of empowerment may still have a strong external leader with very little shared leadership.

Shared leadership and team performance

According to Day, Gronn and Salas (2004), shared leadership should enhance team performance because it is an important intangible resource available to teams. First, shared leadership improves the experience of work by offering an incremental measure of self-determination and opportunity for meaningful impact (Cox, Pearce, & Perry, 2003). This significant worklife experience will bring higher team members' commitment and thus higher team performance. Second, shared leadership also benefits team performance by fully utilizing team members' knowledge and expertise. In complex team environments, a vertical leader is less likely than the team as a whole to have the knowledge and skills required to effectively lead the team and perform the tasks (Pearce & Sims, 2000). Shared leadership however reaches beyond the limits of individual leader capability through mutual influence among team members who are better informed and more responsive to momentary task and leadership challenges (Cox et al., 2003). Therefore, teams with high degrees of shared leadership should experience higher commitment, bring greater personal and organizational resources, and share more information

(Katz & Kahn, 1978). Several recent empirical studies (Avolio et al., 1996; Pearce & Sims, 2002; Ensley et al., 2006) also suggest that shared leadership might indeed enhance team performance, though the amount of empirical evidence documenting the benefits of shared leadership is “modest” (Seers, Keller, & Wilkerson, 2003, p.94) and operationalizations have varied among studies.

Shared leadership has been shown to enhance team effectiveness. Avolio and colleagues (1996) found a positive correlation between shared leadership and self-reported team effectiveness using teams of undergraduate students, and Pearce and Sims (2002) found a significant relationship between shared leadership and change management team effectiveness as rated by managers. Shared leadership was also correlated with more objective measures of performance, such as team sales (Mehra, Smith, Dixon, & Robertson, 2006) and growth in revenue (Ensley et al., 2006). Pearce, Yoo, and Alavi (2004) found that shared leadership in virtual teams was a stronger predictor of team performance than vertical leadership. The effect of shared leadership on team performance is, however, still inconclusive. Neubert (1999), for example, failed to find a relationship between leader dispersion and team performance in manufacturing teams in a field study. Only one empirical study was found to explore the influence of shared leadership in the context of entrepreneurship. An Ensley et al. (2006) study investigated the relative influence of vertical versus shared leadership within new venture top management teams on the performance of startups. The study provided robust evidence for the value of shared leadership in addition to the more traditional concept of vertical leadership.

Moreover, some studies have tried to examine the mechanisms that underpin the benefits of shared leadership. For example, Solansky (2008) showed that shared leadership conferred a sense of team efficacy. In addition, shared leadership was also positively related to transactive

memory, which is the extent to which members recognize the talents, skills, and knowledge of each other (Solansky, 2008).

Factors that might moderate the effects of shared leadership were also explored in the literature. According to Pearce (2004), shared leadership was more appropriate for certain types of knowledge work characterized as interdependent, creative, and complex. Carson et al. (2007) found that shared leadership was more likely to be beneficial when the culture was egalitarian, not hierarchical, when the tasks were complex, and when the roles in the team were interdependent. The level of power that individuals or teams experience might also moderate the effects of shared leadership. According to a field study and a laboratory study by Greer and van Kleef (2010), hierarchy was beneficial in workgroups that were not powerful but damaging in teams that were powerful. Thus, shared leadership might be beneficial in teams that are relatively powerful. However, shared leadership might not be as constructive in other workgroups.

To conclude, empirical studies regarding outcomes of shared leadership remain limited and inclusive, although the initial evidence suggested that shared leadership was related to work team performance. Therefore, more research in a wide variety of contexts was recalled (Conger & Pearce, 2003). In the context of entrepreneurship, the tasks of entrepreneurial teams generally are characterized by interdependence, creativity and complexity because founding teams face a situation of no standard operating procedures or organizational structures (Bryant, 2004). From this perspective, shared leadership is appropriate for entrepreneurial teams for improving performance. Empirical studies, however, remain limited in this area. Empirical studies examining the relationship between shared leadership and entrepreneurial teams should prove desirable in helping researchers better understand entrepreneurial team performance.

Antecedents of shared leadership

Some researchers have been trying to identify the antecedents of shared leadership by focusing on the situational factors of a team, for example team environment and external team coaching (Carson et al., 2007). Shared leadership is more likely to emerge when individuals share a common purpose and when members offer social support to one another (Carson et al., 2007). Furthermore, an external coach to the team, who is helpful, sensitive to the needs of this team, and confident in the capabilities of these individuals, also facilitates shared leadership (Carson et al., 2007). Some demographic factors seem to affect shared leadership. Generally, shared leadership is more pronounced in larger teams, although whether this relationship persists when the number of individuals exceeds seven has not been explored (Carson et al., 2007).

No study exists to identify the dispositional factors that influence the emergence of shared leadership, although previous studies have identified the dispositional factors that could predict the emergence of individual leadership behavior. For example, Lord, De Vader, and Alliger's (1986) meta-analysis showed that several personality traits, such as dominance and masculinity, predicted leadership emergence in teams. Given the potential benefits of shared leadership for entrepreneurial teams, it is desirable to explore whether entrepreneurial team members' personality composition would facilitate shared leadership.

Measurement

Shared leadership has been measured in several ways. First, in many studies, shared leadership was measured by aggregating team members' perceptions about how much influence the team members have over leadership. For example, each team member rated the leadership displayed by the team as a whole, with questions such as "My team members provide a clear vision of who and what our team is" (Pearce & Sims, 2002). These responses were then averaged

across members of each team (see also Avolio et al., 1996; Sivasubramaniam, Murry, Avolio, & Jung, 2002). The strength of this method is that the data collection is relatively easier for research participants. However, the weakness is that the approach may smooth over differences in contributions by individual members (Conger & Pearce, 2003).

Second, shared leadership was measured as a density index by Carson et al. (2007). In the study, participants in a workgroup rated the leadership of every other member by the extent to which the team relied on the leadership of each person on a five point scale. They then added these responses together and divided by the number of possible relationships among team members, yielding an index that was referred to as density in the social network domain.

Third, Mehra et al. (2006) also used a social network construct to measure shared leadership. Team members nominated which members of their workgroup they perceived as leaders. Diagrams of networks were then created and visually inspected to ascertain whether or not they represent distributed leadership. The benefit of the second and third approach is that it better preserved information about the actual pattern of leadership distribution within teams. The primary weakness of the two methods is that it is quite burdensome on participants.

In sum, each approach has its own strengths and weaknesses. Therefore, future research might select the approach that is more relevant to the study context.

Summary of Literature Review

To examine what has been done in prior research regarding the three research questions presented in Chapter one, the current chapter reviewed research on entrepreneurial team diversity and on shared leadership.

The review of literature on the relationship between entrepreneurial team diversity and performance indicates that although there is an impressive amount of research on entrepreneurial team diversity, the results of empirical studies remain inconclusive regarding how entrepreneurial teams are formed and how team composition is related to the performance of entrepreneurial teams. Research gaps still exist and call for future studies.

First, prior research generally indicates that demographic diversity is not significantly related to entrepreneurial team performance. However, this does not mean that demographic variables are unimportant. The common practice of research on entrepreneurial teams is to use demographic variables as proxies for psychological dimensions of entrepreneurial team diversity, but it is evident that “observable demographic factors simply do not provide a reliable portrayal of a person’s makeup” (Hambrick & Mason, 1984, pp 204). Therefore, the important issue is to measure the link between specific demographic variables, underlying psychological constructs and proposed mediators (Mannix & Neale, 2005). More specifically, more precise theorizing, including personal identity or attitude differences for example, that are presumed to be related to team processes and team performance should be included.

Second, evidence of the effect of informational diversity is inconsistent and therefore inconclusive. Bell et al. (2011) indicated that functional background diversity and educational background diversity were consistently and positively related to team performance in general, and more specifically to innovation and to top management teams. However, the review of entrepreneurial team literature in this chapter did not find the consistent results for informational diversity. A possible explanation is that entrepreneurial team performance is related to the extent to which the team recognizes the importance of elaboration in terms of decision-relevant information (van Ginkel & van Knippenberg, 2008). It could be that team members are less

aware of other team members' expertise or unique information that other team members possess, if there are no situational cues drawing their attention to the members' differences. Therefore, research is needed to identify conditions under which informational diversity benefits entrepreneurial team performance.

Third, although researches have suggested the importance of team personality composition to team performance (Harrison et al., 2002; Bell, 2007), research on personality diversity of entrepreneurial teams remains limited. Therefore, it is desirable to empirically explore the relationship between entrepreneurial team personality diversity and performance. Moreover, since personality diversity may interact with team social dynamics to affect team performance, it is desirable to investigate the process through which personality heterogeneity may influence entrepreneurial team performance (Smith et al., 1994). According to the group research literature, conflict among team members mediates the relationship between team diversity and team performance (Williams & O'Reilly, 1998). Such a relationship, however, may not exist for entrepreneurial teams because they often have freedom to select members.

The review of shared leadership literature indicates that there is a small but increasing body of research on shared leadership. The tasks and context of entrepreneurial teams seem appropriate for shared leadership, but empirical research is scarce. More empirical studies are required to examine the role of shared leadership in entrepreneurial teams. Moreover, no study exists to identify the dispositional factors that influence the emergence of shared leadership, although previous studies have identified the dispositional factors that could predict the emergence of individual leadership behavior. For example, personality traits have been shown to be predictive of leadership emergence, but whether entrepreneurial team members' personality composition would facilitate shared leadership remains unknown. Moreover, given the

aforementioned desirability for examining the conditions and mechanisms of the relationship between different types of diversity and entrepreneurial team performance, an investigation of shared leadership as moderator and mediator on this relationship may help researchers better understand the diversity – performance relationship.

In summary, the review indicated that: (1) The relationship between entrepreneurial team diversity and entrepreneurial team performance remains inconsistent and inconclusive; the relationship varies across types of diversity and levels of performance measurement. (2) The inconsistent results regarding relationships between team diversity and entrepreneurial team performance demand future research to explore conditions under which and mechanisms through which team diversity is associated with entrepreneurial team performance. (3) Shared leadership may be a potential team process that can explain the diversity-entrepreneurial team performance linkage.

In Chapter Three, an integrative model is proposed with specific hypotheses, introducing shared leadership as fundamental to the relationship between team diversity and entrepreneurial team performance. The model suggests that shared leadership interacts differently with distinct types of diversity to generate particular performance levels for entrepreneurial teams in early development phases.

CHAPTER 3 MODEL AND HYPOTHESES

The literature review presented in Chapter Two revealed a number of research gaps in the entrepreneurial team literature. The current research filled these gaps by 1) exploring the relationship between entrepreneurial team informational and personality diversity and entrepreneurial team performance, 2) investigating the relationship between shared leadership and entrepreneurial team performance, 3) examining shared leadership as a possible moderator and mediator of the relationship between entrepreneurial team informational and personality diversity and entrepreneurial team performance. A number of hypotheses were proposed to serve as a guide for the current research and were presented in three sections: 1) hypotheses related to team diversity and entrepreneurial team performance, 2) hypothesis related to shared leadership and entrepreneurial team performance, and 3) hypotheses related to the moderation and mediation role of shared leadership.

Hypotheses Related to Team Diversity and Entrepreneurial Team Performance

Research question 1: What is the relationship between entrepreneurial team diversity and performance?

The literature review on entrepreneurial team diversity in Chapter Two showed that the relationship between entrepreneurial team diversity and entrepreneurial team performance varied across different types of entrepreneurial team diversity.

Informational diversity

Due to the wide array of roles and tasks that entrepreneurial teams must take on, it is important that team members have a diverse range of education, knowledge, skills and expertise.

Team members in a diverse team may bring in more information and different perspectives. This added information may enhance team performance when tasks can benefit from multiple perspectives, generating benefits such as innovation or complex problem solving (Williams & O'Reilly, 1998). Moreover, informational diversity also improves the breadth of cognitive ability important for problem solving and decision making (Wittenbaum & Stasser, 1996), because diverse teams have a great variety of information sources to draw from and are likely to make more comprehensive strategic decisions (Mello & Ruckes, 2006). In addition, diverse prior entrepreneurial experience increases entrepreneurial teams' entrepreneurial alertness (cf. Westhead, Ucbasaran, & Wright, 2005) to discover specific market opportunities. Finally, informational diversity is a prerequisite for further learning and assists entrepreneurial teams in the accumulation of new knowledge and skills (Ackerman & Humphreys, 1990). Taken together, entrepreneurial teams with higher informational diversity should be more effective and efficient in running their business.

Hypothesis 1: Informational diversity will positively relate to entrepreneurial team performance.

Personality Composition

Team personality composition refers to two aspects. One aspect is a team's mean score on a particular personality trait. A team with a high mean score on openness to experience would mean that for the team as a unit, team members are more likely to encourage creative, unconventional behaviors. But it does not indicate that all the members are high on this trait, but that at least some team members score high and elevate the average on this trait for the team. Another aspect of the personality composition of teams is team personality diversity, the variance among team members for a particular personality trait. In new ventures, tasks that

concern all entrepreneurial teams include environmental scanning, selecting opportunities, and formulating strategies, as well as management and leadership (Chandler & Jansen, 1992; Shane & Venkatraman, 2000). Research suggests that the compatibility of the members in an entrepreneurial team is a function of both similar and diverse traits (Hackman, 1987; Moreland & Levine, 1992). That is, the performance of entrepreneurial teams depends on not only the team's mean score on certain personality traits but also the team personality diversity on that trait. While certain personality traits may enhance team performance when the team diversity is low, other traits may benefit team performance when team diversity is high. Moreover, the notion of a task and relationship dichotomy in general team functioning is well established (McGrath, 1984; Halfhill et al., 2005). Halfhill et al. (2005) differentiate task-oriented personality traits from relationship-orientated personality traits. Task-oriented personality traits refer to those traits that aid in the completion of work-related activities, such as conscientiousness and openness to experience. Relationship-oriented personality traits facilitate the interpersonal interactions necessary to work as a team, such as agreeableness, extraversion, and emotional stability. The differentiation of task-related and relationship-oriented personality traits helps us better understand relationships between specific Big Five traits and entrepreneurial team performance.

Openness to experience. Openness to experience refers to whether people accept new experiences, are interested in unusual thought processes, and possess creative tendencies (McCrae & John, 1992). Team members high in openness to experience question old assumptions and stimulate new perspectives or ways of doing things (Judge et al., 2002). Consequently, entrepreneurial team members with greater openness are more likely to encourage creative, unconventional behaviors in the workplace. Such creativity is relevant for new ventures

for recognizing opportunities and stimulating novel ideas about products and practices (Ensley et al., 2002). Therefore, entrepreneurial teams with a high mean score on openness to experience will perform better than teams with a lower mean score on this trait.

Hypothesis 2a-I: A team's mean score on openness to experience will positively relate to entrepreneurial team performance.

Entrepreneurial teams are strong social entities, in which team members know one another well, have strong ties, and share knowledge. As a result, if team members are homogeneous in openness to experience, members may be more receptive to the new ideas and suggestions, whereas teams that are diverse in terms of openness to experience may encounter difficulties formulating creative decisions. Therefore, we hypothesize that entrepreneurial teams diverse in openness to experience will hinder entrepreneurial team performance.

Hypothesis 2a-II: Openness to experience diversity will negatively relate to entrepreneurial team performance.

Conscientiousness. Individuals who are high in conscientiousness might be described as reliable, careful, thorough, hardworking, and achievement oriented. Conscientious persons focus on achievement rather than interpersonal relationships (McCrae & Costa, 1987). For new ventures, the market competition is high and all team members need to be highly motivated and work hard. Therefore, team members who are high on conscientiousness likely organize and direct necessary behaviors to produce targeted outcomes and motivate employees to fulfill their job duties more diligently and with more effort (McCrae & John, 1992; Peterson et al., 2003). Moreover, because new venture activities are usually unambiguous, unstructured, and complex (Ensley et al., 2006), powerful and achievement oriented entrepreneurial team members could initiate structure and establish rules that benefit the new venture over time. In sum,

conscientiousness reflects working style and such attitudes as feelings of responsibility for good performance, persistence, and goal-directedness, and entrepreneurial teams with higher level conscientiousness will outperform entrepreneurial teams with lower level conscientiousness.

Hypothesis 2b-I: A team's mean score on conscientiousness will positively relate to entrepreneurial team performance.

Moreover, similarity of such attitudes among team members results in a friendly atmosphere and a strong identification with the entrepreneurial team and the new venture. Entrepreneurial teams homogeneous in conscientiousness may prevent social loafing behavior of team members (Latane, Williams, & Harkins, 1979) and ensure that all team members put efforts into the entrepreneurial process. Otherwise, if entrepreneurial team members are very diverse in conscientiousness, team members will have or interpret the goals differently resulting in team conflict. We therefore hypothesize:

Hypothesis 2b-II: Conscientiousness diversity will negatively relate to entrepreneurial team performance.

Extraversion. The trait of extraversion refers to assertiveness and dominance, as well as sociability, gregariousness, and talkativeness (Costa & McCrae, 1992). In a study of entrepreneurs from India, Malawi, and Ecuador, assertiveness was found to be a differentiator between “successful” and “average” entrepreneurs (McClelland, 1987). Moreover, the ability to establish networks with suppliers, advisors, and customers is a crucial task for entrepreneurial teams, and doing so effectively should increase the likelihood of venture success (Baron & Markman, 2000). Extraversion is also a strong predictor of leadership and salespersons' performance (Judge et al., 2002), which are fundamental for entrepreneurial team and new

venture performance. Thus, a high mean score on extraversion is crucial for entrepreneurial teams.

Hypothesis 2c-I: A team's mean score on extraversion will positively relate to entrepreneurial team performance.

In new ventures, team members high in extraversion usually adopt a transformational leadership style, set visionary goals, and encourage risk taking and creativity (Hofmann & Jones, 2005). Moreover, extraverted members show initiative, take actions, and persuade other members (Bateman & Grant, 1993). Entrepreneurial teams homogeneously high in extraversion may be at disadvantage because all members are very outgoing and less task-focused and relationship conflict and power struggles may result. However, if all members are introverted, no one may be willing to assume leadership when tasks and situations require doing so (Mohammed & Angell, 2003). Therefore, entrepreneurial teams with high diversity in extraversion will perform better than homogenous teams, because entrepreneurial teams typically face different tasks which require team members to assume various roles. Team members who are high in introversion seek depth over breadth, and delve into issues and ideas before moving on to new ones (Neuman, Wagner, & Christiansen, 1999). Moreover, entrepreneurial teams with higher personality diversity in extraversion should have members that complement one another and fill different roles within the team, whereas teams with lower diversity in extraversion should experience more role conflict and perform less effectively (Barry & Stewart, 1997).

Hypothesis 2c-II: Extraversion diversity will positively relate to entrepreneurial team performance.

Agreeableness. The trait of agreeableness assesses one's interpersonal orientation and includes altruism, likability, kindness, and nurturance (Digman, 1990). Individuals scoring high

on Agreeableness tend to be kind, considerate, sympathetic, and helpful (Costa & McCrae, 1992). They are interested in helping others and deal with conflict in a cooperative and collaborative way (Digman, 1990). Entrepreneurial teams with members high on agreeableness have cooperative values and a preference for positive interpersonal relationships, resulting in positive team climate. The ability to build trusting relationships with venture capitalists (Cable & Shane, 1997) or among entrepreneurial team members (Eisenhardt & Schoonhoven, 1990) is critical to entrepreneurial success. As such, it is plausible that a level of agreeableness is necessary to receive the required support to get a new venture started. However, because entrepreneurship involves establishing a for-profit enterprise that is built around the entrepreneur's own needs and interests (Singh & DeNoble, 2003), entrepreneurial teams must fight hard for the survival of the new businesses. Because entrepreneurial teams usually only have limited resources and small room for error, being too trusting may be detrimental for survival and growth (Zhao & Seibert, 2006). Thus, a team's mean score on agreeableness will not significantly relate to entrepreneurial team performance.

Hypothesis 2d-I: A team's mean score on agreeableness will not significantly relate to entrepreneurial team performance.

However, team personality diversity on agreeableness may benefit entrepreneurial team performance. On the one hand, some team members high on agreeableness would be essential to create a positive team climate, deemphasizing status and power differences, and encouraging information sharing among team members (Peterson et al., 2003). On the other hand, team members lower in agreeableness may dare to express concerns about unreasonable ideas and prevent teams from groupthink. Therefore, high diversity in agreeableness benefits entrepreneurial team performance.

Hypothesis 2d-II: Agreeableness diversity will positively relate to entrepreneurial team performance.

Emotional stability. The fifth dimension of the Big-5 personality traits, emotional stability, refers to an individual's tendency to be well-adjusted, relaxed, self-assured, and calm (McCrae & John, 1992). The negative pole of this personality dimension is called neuroticism. Individuals lower in emotional stability tend to experience a number of negative emotions including depression, irritability, and anxiety (Costa & McCrae, 1992). The work environment, workload, work-family conflict and financial risk of starting and running a new business can produce high physical and psychological stress. Therefore, emotional volatility and worrying are expected to be obstacles for entrepreneurial team success (Vesper, 1990). Zhao et al. (2010) meta-analysis provided evidence that emotional stability was positively related to entrepreneurs' performance. Therefore, team's mean score on emotional stability will positively relate to entrepreneurial team performance.

Hypothesis 2e-I: A team's mean score on emotional stability will positively relate to entrepreneurial team performance.

Not only the team's mean score on emotional stability but also the personality diversity on emotional stability affects entrepreneurial team performance. On the one hand, evidence indicates that individuals who score low on emotional stability are better at identifying threats in the environment (Tamir, Robinson, & Solberg, 2006) and anticipating and avoiding the danger from the environment (Nettle, 2006). Therefore, entrepreneurial teams with some members lower at emotional stability may help new ventures avoiding risks from the environment. On the other hand, entrepreneurial teams should have the abilities to maintain and establish good relations with customers, employees, suppliers, financiers and other people related with the business to

run it effectively and efficiently. Team members with higher level of emotional stability may help entrepreneurial teams establish these warm human relations. Therefore, we expect that emotional stability diversity will positively relate to entrepreneurial team performance.

Hypothesis 2e-II: Emotional stability diversity will positively relate to entrepreneurial team performance.

Hypothesis Related to Shared Leadership and Entrepreneurial Team Performance

Research question 2: What is the effect of shared leadership on entrepreneurial team performance?

Tasks of entrepreneurial teams are typically characterized by interdependence, creativity and complexity because new venture founding teams face a situation of no standard operating procedures or organizational structures (Bryant, 2004). Shared leadership is appropriate for this type of team work (Pearce, 2004). In an entrepreneurial team, it is very rare that the leading entrepreneur has all the knowledge and skills to effectively lead the team and perform entrepreneurial tasks (Pearce & Sims, 2000). By sharing leadership among team members, the team as a whole is better informed and more responsive to tasks at hand. Moreover, shared leadership can also increase members' commitment and encourage more information sharing (Cox et al., 2003).

Hypothesis 3: Shared leadership will positively relate to entrepreneurial team performance.

Hypotheses Related to the Moderation and Mediation Role of Shared Leadership

Research question 3: What is the role of shared leadership in the relationship between team diversity and entrepreneurial team performance?

Moderating effect of shared leadership

Theoretically, diverse entrepreneurial teams should outperform homogeneous teams because diverse teams are more likely to possess a broader range of task-relevant knowledge, skills and abilities (Williams and O'Reilly, 1998), which should lead to more innovative ideas and solutions (De Dreu & West, 2001) that are important to new venture performance. The literature review presented in Chapter Two however revealed that the relationship between informational diversity and entrepreneurial team performance is inconsistent and thus inconclusive. Teams with high a degree of shared leadership are more likely to utilize the diverse knowledge and skills held by different team members. For example, the purpose of the cross-functional team is to bring a very diverse set of functional expertise and experience together. Unfortunately, the formal leader is at a genuine knowledge disadvantage because his/her background normally represents only one of the numerous functions (Pearce, Manz, & Sims, 2009). With the development of shared leadership in teams, members assume different roles in leadership and the diverse expertise could be utilized fully by the team. Thus, we hypothesize the moderating role of shared leadership as follows:

Hypothesis 4: Shared leadership moderates the relationship between informational diversity and entrepreneurial team performance such that the relationship will be significantly stronger in teams with a high degree of shared leadership.

Mediating effects of shared leadership

In keeping with the argument that entrepreneurial team diversity in members' personality traits relates to entrepreneurial team performance, shared leadership among team members may serve as a mediator within this relationship. In the previous section, the link between team personality diversity and entrepreneurial team performance (Hypotheses 2a-2e) and the link

between shared leadership and entrepreneurial team performance (Hypothesis 3) have been established. Therefore, to further posit that shared leadership has a mediating effect on the relationship between team personality diversity and entrepreneurial team performance, the link between team personality diversity and shared leadership must be examined.

According to the trait theory of leadership, individuals with certain personality traits are more likely to excel in leadership roles than others. For example, the Big Five model has been widely studied in the context of leadership (e.g., De Hoogh, Den Hartog, & Koopman, 2005; Judge et al., 2002). A recent meta-analysis of research on Big Five personality dimensions and leadership revealed that emergent leadership is moderately correlated with Big-5 personality traits (Judge et al., 2002). In leadership literature, leadership behaviors have been commonly classified into two broad categories: task focused behaviors dealing with task accomplishment and relationship focused behaviors facilitating team interaction ((Bass, 1967; Blake & Mouton, 1964; Fiedler, 1967; Fleishman et al., 1991). In new ventures, the complexity and interdependence of entrepreneurial tasks and a single member's lacking of all required skills and knowledge require the development of shared leadership among team members. However, whether shared leadership could be developed depends to some extent on the configuration of team members' personality at the team level.

Although Big-5 personality traits have been shown to relate to leadership behavior in literature (Judge et al., 2002), whether personality diversity across team members relates to shared leadership has not been investigated either theoretically or empirically. Drawing from leadership theories and group research (Hackman, 1987; Judge et al., 2002), we posit that the team personality diversity – entrepreneurial team performance relationship may be explained more fully by examining the mediating role of shared leadership. That is, having a diverse or

homogeneous entrepreneurial team seems insufficient for higher entrepreneurial team performance; team personality diversity affects entrepreneurial team performance through the development of shared leadership among team members. The reasoning is as follows.

On the one hand, shared leadership may mediate the relationship between personality diversity and entrepreneurial team performance because team members who are homogeneous on certain personality traits may more likely to assume leadership roles when situation requires. At first, conscientiousness is a predictor of leadership emergence and leadership effectiveness (Judge et al., 2002). Conscientious individuals have more tenacity and persistence in their activities (Goldberg, 1990), which are related to leadership. Openness to experience correlates with divergent thinking (McCrae, 1987) and is strongly related to both personality based and behavioral measures of creativity (Feist, 1998; McCrae & Costa, 1997). Creativity appears to be an important skill of effective leaders, suggesting that open individuals are more likely to emerge as leaders and be effective leaders (Sosik, Kahai, & Avolio, 1998). Conscientiousness and openness to experience are the two task oriented personality traits. In entrepreneurial teams that are diverse on these two dimensions, individuals lower on the two dimensions would not be willing to assume leadership roles when the entrepreneurial tasks at hand are of their expertise. Therefore, we predict that whereas team diversity on openness to experience and team diversity on conscientiousness negatively influence entrepreneurial team performance, these effects are indirect and would occur through the mediating influence of shared leadership.

Hypothesis 5a: Shared leadership mediates the relationship between team openness to experience diversity and entrepreneurial team performance.

Hypothesis 5b: Shared leadership mediates the relationship between team conscientiousness diversity and entrepreneurial team performance.

On the other hand, shared leadership may also mediate the relationship between personality diversity and entrepreneurial team performance because team members who are heterogeneous on certain personality traits may assume leadership roles that could complement one another. Shared leadership indicates the existence of multiple leaders (Pearce & Sims, 2000). Therefore what may be most important is whether multiple leaders are able to coordinate effectively. When multiple leaders do not recognize one another as leaders, the team can literally be torn apart (Mehra et al., 2006). When they recognize one another's different leadership roles, the teams should be better able to synchronize their leadership efforts so that team functioning is more effective. When team members' personality traits complement one another, members are more likely to assume different leadership roles. That is, team personality diversity on extraversion, agreeableness, and emotional stability may influence entrepreneurial team performance through the development of shared leadership, taking different leadership roles when a situation requires. For example, team members higher in extraversion may display more relationship-oriented leadership behavior because both of the major facets of extraversion - dominance and sociability - are related to self- and peer-ratings of leadership (Gough, 1990). Team members who are high in introversion seek depth over breadth, and delve into issues and ideas before moving on to new ones, and therefore are more likely to assume a task-oriented leadership role. Managing risk is one of the responsibilities of entrepreneurial teams. Team members who score low on emotional stability may be better assuming leadership roles when identifying threats in the environment is necessary (Tamir et al., 2006). In contrast, team members high in emotional stability can positively influence other members' emotions and motivations through positive emotional contagion (Barsade, 2002). Diversity in agreeableness will also facilitate the development of shared leadership among entrepreneurial team members.

Team members high in agreeableness are interested in helping others and deal with conflict in a cooperative and collaborative way (Digman, 1990), which are characteristics of relationship-oriented leadership behavior. However, team members lower in agreeableness may display task-oriented leadership by expressing concerns about unreasonable ideas and preventing teams from groupthink. Taking these expectations together, we propose the following:

Hypothesis 5c: Shared leadership mediates the relationship between team extraversion diversity and entrepreneurial team performance.

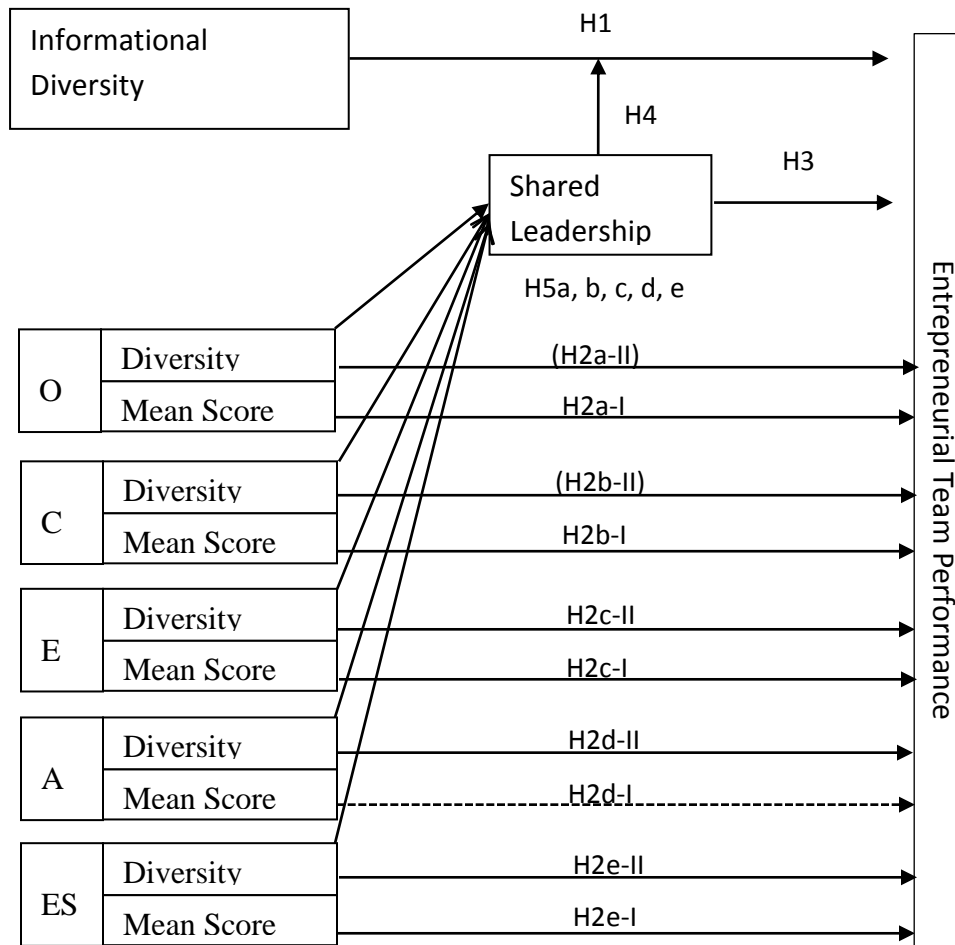
Hypothesis 5d: Shared leadership mediates the relationship between team agreeableness diversity and entrepreneurial team performance.

Hypothesis 5e: Shared leadership mediates the relationship between team emotional stability diversity and entrepreneurial team performance.

Summary of Hypotheses

Figure 2 displays the hypothesized relationships among team diversity, shared leadership and entrepreneurial team performance. The study design and methodological issues were presented in Chapter Four.

Figure 2

Theoretical Framework of Entrepreneurial Team Diversity, Shared Leadership and Performance

Note: O – Openness to experience; C – Conscientiousness; E – Extraversion; A – Agreeableness; ES – Emotional Stability; () indicates negative relationship.

CHAPTER 4 METHOD

This chapter presents the methods and procedures used to test the hypotheses presented in Chapter Three. The chapter is divided into the following sections: Sample, Research Design and Procedures, Measures, and data analysis.

Sample, Research Design, and Procedures

The sample consisted of 200 entrepreneurial teams in a technology incubator founded in 2009 by the local government of Hangzhou, Zhejiang province of China. With support from the government, the incubator aims to support up to 300 start-up companies. The incubator offers start-ups with office space and shared administrative services. Entrepreneurs who wish to enter the incubation program must apply for admission. Acceptance criteria vary from program to program, but in general only those with feasible business ideas and a workable business plan are admitted. Other general acceptance criteria include (1) team members are college students or graduates within 5 years, (2) the start-up was registered after 2008, and (3) the leading entrepreneur has more than 30% of the ownership of the start-up. The focus on firms within a single region allows us to hold constant key labor market and environmental conditions.

This study used a cross-sectional study design. Participants were given a questionnaire which collected data on the independent, dependent, and control variables as well as background information, as described in detail in the next section. Because all the measures were assessed by the self-reported questionnaire, common method bias might affect the result. However, the bias should be minimized in the current study. First, the measures of education background and number of employees were objective measures and were unlikely to be subject to common

method bias. Second, the measure of shared leadership was from other ratings (other team members' ratings) rather than self-ratings.

To test hypotheses, a web-based survey instrument was created that included questions about independent, dependent, moderator/mediator, and control variables as well as other background information about the entrepreneurial team and the start-up. The English version of the instrument is presented in Appendix A. The instrument was translated into Chinese and back-translated into English by two independent bilinguals to ensure meaning equivalence across the two cultures. High quality back-translations are important because close correspondence between the original source language version and the back-translated source language version is required before reliance can be placed on results based on translated scales (Hulin, 1987). The Chinese version of the instrument is presented in Appendix B.

The survey was designed and distributed online using a PHP-based (Personal Home Page) open source survey tool in China. This system enabled data collection while ensuring anonymity and confidentiality. The final instrument contained 87 questions and took approximately 30 minutes to complete according to pilot tests of five individuals.

Permission to conduct research in the Chinese incubator was sought by contacting the administrative office of the incubator in early November 2011. Then the link to the online survey was sent to each entrepreneurial company by the administrative office after the author received Baruch IRB approval. Participation in the survey was voluntary and respondents could quit the survey at any time. A reminder was sent out to potential participants two weeks after the first solicitation.

The anonymity and confidentiality were assured in several ways. First, subjects responded to the survey anonymously and no personally identifiable information was collected to

assure the confidentiality of the subjects. The only demographic information collected was gender and age, to enable the description of the sample. To match each subject to the entrepreneurial team, subjects were asked to provide the initials of the name of the company and each team member rather than the full name. Second, the link to the survey was sent to participants by the administrative office of the incubator and therefore the email addresses of participants and the data were separated, so that the researcher of this study had no access to the email list while the administrative office of the incubator had no access to the data. Hence, the anonymity of participants was guaranteed. Third, despite the fact that data would not be personally identifiable, information obtained as described above will at no time be shared with anyone else. Data are stored on a server provided by a professional survey provider. The account is secured using a string password (using upper and lower case letters, numbers, and special characters).

Measures

Independent Variables

Informational diversity. Informational diversity was measured on four dimensions: functional specialty, educational specialty, educational level, and managerial skills. The first three dimensions are categorical variables and were reported by respondents as part of the survey. Functional specialty was measured by asking respondents to identify the functional areas in which they have expertise. Nine categories of functional areas (Bunderson & Sutcliffe, 2002) are available, including marketing, sales/customer service, finance/accounting, general management, human resources/personnel, information technology, R&D, administrative support, and operations/distribution/logistics. Educational specialty consisted of nine different categories based on the international standard for educational classification (ISCED 97), using a one digit

level measure. Educational level was measured with five categories: no high school diploma, high school graduate, college graduate, master's degree, and doctoral degree.

Blau's (1977) index was used to calculate a diversity index for each of the three variables. The formula for calculating Blau's (1977) index is as follows:

$$Blau's\ Index = 1 - \sum p_i^2$$

where p_i is the proportion of the population in a given team in the i^{th} category. The Blau's index ranges from 0 (completely homogeneous entrepreneurial team) to 1 (completely heterogeneous entrepreneurial team) for each of the three dimensions. The fourth dimension, management skills, was measured with a scale developed by Herron (1990). Respondents were asked to rate their skill level on each of the seven items with regard to product design, industry analysis, organizational design, motivating employees, creating a sphere of influence, planning and administration, and discovering opportunities. The measurement was a five-point Likert-type scale ranging from (1) Not Effective to (5) Extremely Effective. A past Cronbach's coefficient alpha for the measure was 0.76 (Herron, 1990). The coefficient of variation was used as the measure of team diversity for the Herron (1990) skills measure ranging from 0 (completely homogenous) to 1 (completely heterogeneous).

The overall informational diversity index was calculated by summing Blau's index scores for the first three dimensions with the coefficient of variation scores for the managerial skills measure. The informational diversity index ranges from 0 (completely homogenous) to 4 (completely heterogeneous).

Team's mean score on personality traits and personality diversity. Team members' Big-5 personality traits were measured by the Chinese Version of NEO-Five Factor Inventory (NEO-FFI) (Costa and McCrae, 1992). The NEO-FFI has 60 items (12 items per domain) on five NEO

domains: openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability. NEO-FFI was used for this study because it is a widely used personality measure with high reliability. The Cronbach's coefficient alphas for the five dimensions have ranged from .75 to .83 (Costa and McCrae, 1992). The scale was also cross-culturally validated, and the robustness of the NEO-FFI has been proven in the Chinese culture (McCrae, Costa, & Yik, 1996; Yik & Bond, 1993). A team's mean score on the personality traits was measured by the mean personality score on each personality trait in each team. Team personality diversity was measured by the standard deviation of personality scores on each personality trait in each team (Barrick et al., 1998).

Dependent Variables

Entrepreneurial team performance was measured by a 16-item scale developed by Pearce and Sims (2002) to evaluate team effectiveness with six dimensions: (a) output effectiveness, (b) quality effectiveness, (c) change effectiveness, (d) organizing and planning effectiveness, (e) interpersonal effectiveness, and (f) overall effectiveness. Responses were given along a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The Cronbach's alpha for the scale is 0.92. Each team member was asked to respond to the 16 items. Then the entrepreneurial team performance was measured as the mean score across team members. This team level performance measure reflects the entrepreneurial team process and indicates how the team has functioned.

Moderator and Mediator: Shared Leadership

Shared leadership was measured with the approach used by Carson et al. (2007) focusing on density, which is a measure of the total amount of leadership displayed by team members as

perceived by others on a team. Every team member rated each of his/her peers (1, “not at all,” to 5, “to a very great extent”) on the following question: “To what degree does your team rely on this individual for leadership?” The density was calculated by summing all values and then dividing that sum by the total number of possible ties, or relationships, among team members (Sparrowe et al., 2001).

Control Variables

Team size. Team size influences team process and functioning; for instance, Bantel and Finkelstein (1991) suggests that larger teams have lower cohesion. And team size may influence resources and workload requirements that may influence entrepreneurial team performance (Kirkman & Rosen, 1999). Therefore team size was included as a control variable in this study and was measured as the actual number of members on each team.

Ownership dispersion. Employee ownership affects a member’s commitment to an enterprise and willingness to work together productively (Buchko, 1992; Rosen & Quarrey, 1987). Therefore, stock ownership dispersion among entrepreneurial team members may have an effect on their shared leadership behavior and team performance and should be included as a control variable. Ownership dispersion was measured by the following formula (Jacquemin & Berry, 1979):

$$Owner\ Dispersion = \sum_{i=1}^N S_i \ln\left(\frac{1}{S_i}\right)$$

where S_i is the percentage of shares owned by the i^{th} entrepreneurial team member. The value of ownership dispersion increases as ownership is spread more evenly across team members.

Data Analysis

Measurement Validation and Common Method Bias

The measure of team effectiveness was translated into Chinese from the English version and has not been validated in the Chinese culture. Therefore, a confirmatory factor analysis (CFA) was conducted to assess its cross-cultural validity and reliability prior to the hypotheses testing. Because the measures of mean score on personality traits and team effectiveness at team level were aggregated from individual scores, the viability of aggregation needed to be examined. This was done by calculating within-group agreement (r_{wg} ; James, Demaree, & Wolf, 1984), intraclass correlations (ICC[1]), and the reliability of the means (ICC[2]; Bliese, 2000). These measures showed whether it was statistically appropriate to analyze this variable at the team level.

To assess the potential impact of common method bias, Harman's single-factor test was performed by using Confirmatory Factor Analysis (CFA) techniques (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). All the items from the survey were included into a factor analysis to determine whether the majority of the variance could be accounted for by one general factor.

Hypotheses Testing

Hierarchical regression analysis was used to examine the relationships among team diversity, shared leadership and team performance. In step 1, only control variables were entered. In step 2, a team's mean score on personality traits, informational diversity and personality diversity variables were entered. In step 3, shared leadership was included. In step 4, the interaction of informational diversity and shared leadership was entered to test the moderation of shared leadership. To test the mediation effect of shared leadership on the relationship between

personality diversity and entrepreneurial team performance, both the Baron and Kenny (1986) method and the Sobel test (Preacher & Hayes, 2004) were used. The Sobel test is considered to be a more powerful tool to establish a mediation effect than the Baron and Kenny (1986) stepwise procedure (Preacher & Hayes, 2004), but both were used because Baron and Kenny (1986) approach can show change of the regression coefficients while the Sobel test can quantify the magnitude of mediation (MacKinnon et al. 2002).

Summary of Method

The purpose of this study is to investigate the impact of shared leadership on the relationship between entrepreneurial team diversity (informational diversity and personality diversity) and performance. Data were collected from 200 entrepreneurial start-ups in a Chinese incubator through a variety of instruments whose validity and reliability have been tested. Hierarchical linear regression was used to test the hypotheses. Chapter five reports the results of data analyses. Chapter six discusses the significance of the findings and provides recommendations for future research.

CHAPTER 5

RESULTS

The purpose of this study is to investigate the moderating and mediating effects of shared leadership on the relationship between entrepreneurial team diversity and performance. Data were gathered from 154 entrepreneurial teams (response rate = 77%) consisting of 516 entrepreneurs. The average age of entrepreneurs was 28 years ($SD = 3.6$). Of the 516 entrepreneurs, 42.1 percent were female and 57.9% were male. Of the 154 teams, 10 teams consisted of only 2 members for each team. These 10 teams were dropped because a diversity measure could not be calculated from a 2-member team. Thus, data analysis was based on usable data from 144 entrepreneurial teams. This chapter is organized into the following sections. The first section discusses the data aggregation issue and presents the descriptive statistics. The second section presents the results regarding the link between informational diversity and entrepreneurial team performance, as well as the moderating effect of shared leadership on this link. The third section presents results regarding relationships between team personality composition variables (mean score and diversity) and entrepreneurial team performance. The fourth section provides results of the mediating effects of shared leadership. A summary of key findings is presented at the end of this chapter.

Data Aggregation and Descriptive Statistics

Because the measures of mean score on personality traits and team effectiveness at the team level were aggregated from individual scores, the viability of aggregation needed to be examined. This was done by calculating within-group agreement ($r_{wg} = .92$; James, Demaree, & Wolf, 1984), intraclass correlations ($ICC[1]=0.58$), and the reliability of the means ($ICC[2]=0.82$;

Bliese, 2000). These measures showed that it was statistically appropriate to analyze this variable at the team level. To test for potential common method bias, the Harman's single-factor analysis (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) was conducted with an exploratory factor analysis and CFA of the one-factor model. The exploratory factor analysis generated seven factors, and the first factor explained only 17% of the total variance, suggesting that common method bias is unlikely to be a serious concern for the current study.

Table 4 presents the means, standard deviations, and zero-order correlations for all of the variables used in the analysis. The correlations reveal several significant relationships between team personality characteristics and entrepreneurial team performance. Teams with higher levels of Conscientiousness ($r=.27$, $p<.01$), Extraversion ($r=.26$, $p<.01$), or Openness to Experience ($r=.36$, $p<.01$) had significantly higher performance levels. Teams with higher levels of Agreeableness diversity ($r=.48$, $p<.01$), Extraversion diversity ($r=.22$, $p<.01$), or Emotional Stability diversity ($r=.23$, $p<.01$) performed better. But teams with lower levels of Conscientiousness diversity ($r= -.22$, $p<.01$) or Openness to Experience diversity ($r= -.20$, $p<.05$) performed better. The correlation between shared leadership and entrepreneurial team performance was also significant ($r=.45$, $p<.01$). These findings are consistent with the hypotheses in this study.

Table 4

Descriptive Statistics^a

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1 Team Size	3.5	.68																		
Ownership																				
2 Dispersion	.2	.33	-.06																	
3 A_mean	30.0	3.36	.01	.12																
4 C_mean	31.7	3.40	.05	-.05	.07															
5 E_mean	29.2	3.83	-.16	.08	0.24**	0.44**														
6 ES_mean	27.4	3.60	-.04	.05	.06	0.42**	0.53**													
7 O_mean	28.3	4.52	-.09	.06	.16	.09	0.33**	0.25**												
8 O_sd	6.2	3.09	-.10	.10	-.02	0.18*	.00	.00	-.16*											
9 A_sd	5.3	2.71	.00	.01	-.028**	.15	.05	.14	.15	-.20*										
10 C_sd	5.8	3.02	.08	.00	.06	-.030**	-.02	.018	.07	.07	-.019*									
11 E_sd	6.0	2.89	.15	-.03	.03	.06	-.016	.10	.15	-.07	0.18*	0.27**								
12 ES_sd	7.2	3.17	.05	-.16	.05	0.27**	.07	.05	0.17*	.13	.14	0.17*	0.28**							
Shared																				
13 Leadership	3.5	.64	.00	-.03	-.021*	0.22**	.04	.03	0.17*	-.017*	0.27**	-.14	0.25**	0.19*						
14 Ed. level Div.	.4	.22	.25	.04	.13	-.01	-.03	.11	-.05	-.13	.05	.07	.04	-.08	.00					
15 Ed. Major Div.	.6	.16	0.28**	.06	-.08	-.02	.00	.00	.01	-.12	.10	.11	.12	.07	.11	0.18*				
16 Functional Div.	.6	.14	0.43**	-.11	.02	.13	.00	.13	.00	-.16	.13	.01	0.17*	.04	.15	0.35**	0.46**			
17 Skill diversity	.5	.14	0.22**	-.05	.03	.02	.07	-.09	0.18*	-.10	.06	-.02	-.03	.07	.09	.07	0.36**	0.37**		
Team																				
18 Performance	42.4	8.57	-.03	-.13	-.017*	0.27**	0.26**	0.19*	0.36**	-.02*	0.48**	0.22**	0.22**	0.23**	0.45**	.06	.06	0.31**	.10	

^aN=144 teams.

* p < .05

** p < .01

Tests of Hypotheses:

Informational Diversity, Shared Leadership, and Entrepreneurial Team Performance

To test hypothesis 1 that informational diversity positively relates to entrepreneurial team performance, entrepreneurial team performance was first regressed on control variables (team size and ownership dispersion) and informational diversity. The model was not significant. Team informational diversity was calculated by combining the diversity on four different dimensions: education level diversity, education major diversity, functional diversity, and skill diversity. The correlations in Table 4 reveal that only functional diversity was significantly related to entrepreneurial team performance ($r=.31, p<.01$). Therefore, diversity scores on each of the four dimensions rather than the informational diversity index were used in all the regression analyses. The hierarchical regression results are presented in Table 5. Model 1 only included control variables in the regression and was not significant ($F=1.25, n.s.$).

Adding diversity scores on education level, education specialty, functional specialty, and skills in Model 2, the model was significant ($F=3.73, p<.01$). Hypothesis 1 that informational diversity is positively related with entrepreneurial team performance was only partially supported for functional specialty diversity ($\beta=.42, p<.01$). No support was found for diversity scores on educational level ($\beta= -.03, n.s.$), educational major ($\beta= -.07, n.s.$), and skills ($\beta= .01, n.s.$).

To test hypothesis 4 that shared leadership moderates the relationship between informational diversity and entrepreneurial team performance, the interaction between each of the four dimensions of informational diversity and shared leadership were included in Model 6. The interaction of skill diversity and shared leadership had a positive coefficient ($\beta=1.96, p<.01$). This partially supported hypothesis 4 that the positive relationship between informational

diversity and entrepreneurial team performance is greater from teams with higher levels of shared leadership. Figure 3 depicts the predicted relationships plotted using the procedures outlined in Aiken and West (1993). However, the interaction of the other three informational diversity dimensions and shared leadership was not significant.

Figure 3

Results of Moderating Effect of Shared Leadership on the Link between Skill Diversity and Entrepreneurial Team Performance

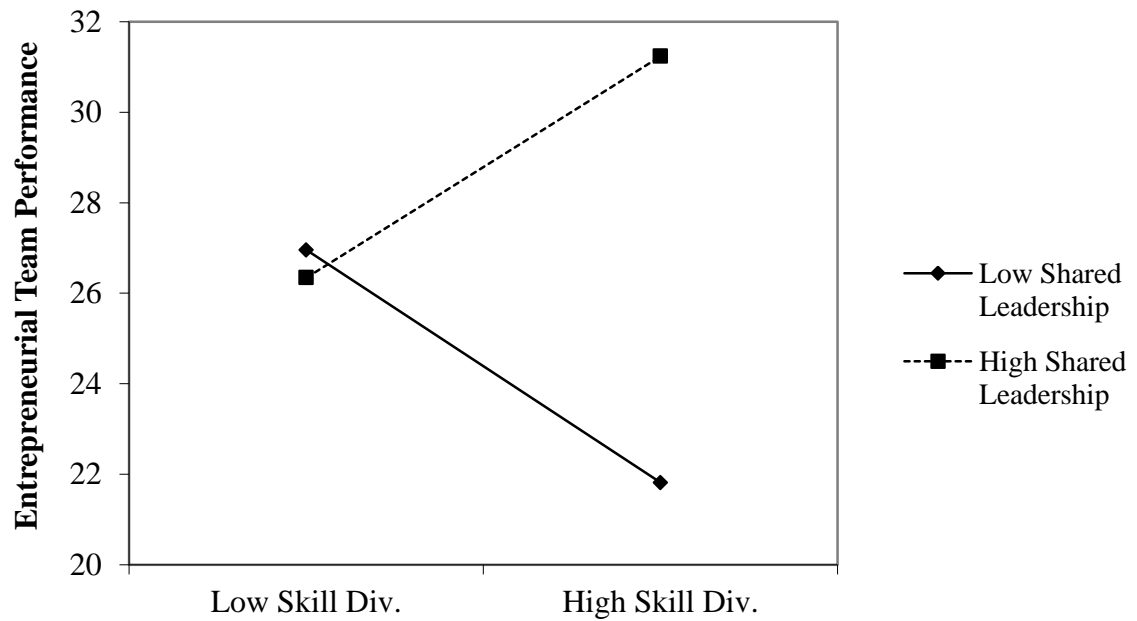


Table 5

Results of Hierarchical Regression Models^a

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	β	β	β	β	β	β
Team size	-.04	-.19	-.13	-.11	-.09	-.05
Ownership Dispersion	-.13	-.09	-.08	-.07	-.08	-.08
Education Level diversity		-.03	.05	.05	.04	.50
Education Major diversity		-.07	-.08	-.09	-.10	-.52
Functional Diversity		.42**	.40**	.35**	.33**	.46
Skill Diversity.		.01	-.08	-.08	-.08	-1.62**
Agreeableness Mean			-.29**	-.21**	-.16*	-.12
Conscientiousness Mean			.18*	.03	-.02	-.09
Extraversion Mean			.18*	.23**	.23**	.27**
Emotional Stability Mean			-.12	-.10	-.08	-.09
Openness Mean			.37**	.27**	.24**	.20**
Agreeableness Diversity				.25**	.24**	.23**
Conscientiousness Diversity.				-.21**	-.18*	-.22**
Extraversion Diversity				.12	.08	.10
Emotional Stability Diversity				.14*	.12	.16*
Openness Diversity				-.08	-.05	-.02
Shared Leadership					.20**	-.74*
Education Level Diversity *Shared Leadership						-.46
Education Major Diversity * Shared Leadership						.48
Functional Diversity * Shared Leadership						-.27
Skill Diversity * Shared Leadership						1.96**
Model F Statistics	1.25	3.73**	7.35**	8.84**	9.26**	10.21**
R ²	.02	.14	.38	.53	.56	.64
Adjusted R ²	.00	.10	.33	.48	.50	.58
ΔR^2	.02	.12	.24	.15	.03	.08

^aN=144 teams; β : Standardized regression coefficient.

* p < .05

** p < .01

Tests of Hypotheses:

Team Personality Composition and Entrepreneurial Team Performance

To test hypotheses regarding the relationships between team personality composition variables and entrepreneurial team performance, the mean scores of each Big-5 personality trait were included in regression in Model 3 ($F=7.35$, $p<.01$), and then diversity of each Big-5 personality trait were included in regression in Model 4 ($F=8.84$, $p<.01$).

Personality mean scores and entrepreneurial team performance

Results of Model 3 indicate that the Openness mean score had a significant relationship with entrepreneurial team performance ($\beta=.37$, $p<.01$), as did the Conscientiousness mean score ($\beta=.18$, $p<.05$), and the Extraversion mean score ($\beta=.18$, $p<.05$). These findings provide support for hypotheses H2a-I, H2b-I, and H2c-II. However, Hypothesis H2d-I that the Agreeableness mean score is not significantly related with entrepreneurial team performance was not supported. Actually, Agreeableness was shown to be negatively related to entrepreneurial team performance ($\beta= -.29$, $p<.01$). The relationship between the Emotional Stability mean score and entrepreneurial team performance was not significant ($\beta= -.12$, n.s.), therefore H2d-I was not supported.

Personality diversity and entrepreneurial team performance

Personality diversity on each of the Big-5 traits were included in Model 4 to test hypotheses 2a,b,c,d,e-II. Agreeableness diversity was positively related to entrepreneurial team performance ($\beta=.25$, $p<.01$), as was Emotional Stability diversity ($\beta=.14$, $p<.05$), and therefore H2d-II and H2e-II were supported. As hypothesized, Conscientiousness diversity was negatively related to entrepreneurial team performance ($\beta= -.21$, $p<.01$). H2e-II was marginally supported because Extraversion diversity was only marginally related to entrepreneurial performance

($\beta=.12$, $p<.10$). The relationship between Openness diversity and entrepreneurial team performance was not significant, thus hypothesis 2a-II was not supported.

Tests of Hypotheses:

Mediating Effects of Shared Leadership

In Model 5, shared leadership was included into the regression to test Hypothesis 3, which specifies a positive relationship between shared leadership and entrepreneurial team performance. The model explains a significant amount of the variance in entrepreneurial team performance ($R^2= .50$, $p< .01$). The results indicate a positive and significant relationship between shared leadership and entrepreneurial team performance ($\beta= .20$, $p<.01$), supporting Hypothesis 3.

To test Hypotheses H5a, b, c, d, and e, which specify mediated relationships from personality diversity to entrepreneurial team performance via shared leadership, Baron and Kenny's (1986) procedure for identifying mediating effects was followed. First, shared leadership was regressed on diversity scores on each of the Big-5 traits. Table 6 displays the results of the regression. Conscientiousness diversity ($\beta= -.18$, $p<.05$) and Extraversion diversity ($\beta= .23$, $p<.01$) are significantly related to shared leadership, but the hypothesized relationships between Openness diversity, Agreeableness diversity, and Emotional Stability diversity, respectively, were not supported. Second, entrepreneurial team performance was regressed on the personality diversities in Model 4 (Table 5), indicating that diversities on Agreeableness, Conscientiousness, and Emotional Stability have direct effects on entrepreneurial team performance. Third, in Model 5 entrepreneurial team performance was regressed on both the diversity scores and shared leadership. Changes in the regression coefficients of Agreeableness

diversity ($\Delta\beta = .01$), Conscientiousness diversity ($\Delta\beta = .03$), and Emotional Stability diversity ($\Delta\beta = .02$) indicate the possible mediating effects of shared leadership on these three dimensions. However, the Baron and Kenny (1986) procedure could not test the significance of the changes in regression coefficients. Moreover, recent research suggested that it is not necessary to demonstrate a direct effect between the independent and dependent variables, an important step in the Baron and Kenny method (Shrout & Bolger, 2002). The Sobel test is considered to be a more powerful tool to establish mediation effect than the Baron and Kenny (1986) stepwise procedure (Preacher & Hayes, 2004). Therefore, a Sobel test was conducted to test hypotheses regarding the mediating effects of shared leadership. Table 6 presents the results of the Sobel test¹. With shared leadership as a mediator, the Sobel test statistics are significant for Conscientiousness diversity ($p < .05$) and Extraversion diversity ($p < .05$). Therefore, the Sobel test provided support for Hypothesis 5b and Hypothesis 5c.

Table 6

Sobel Tests for the Mediating Effects of Shared Leadership

Variables	Shared Leadership (β)	Entrepreneurial Team Performance
		Shared Leadership <i>Sobel Statistic (s.e)</i>
Team Size	-.04	
Ownership Dispersion	0.01	
Openness Diversity	-.14	-1.5(.07)
Agreeableness Diversity	.15	1.63(0.08)
Conscientiousness Diversity	-.18*	-1.93(0.07)*
Extraversion Diversity	.23**	2.18(0.08)*
Emotional Stability Diversity	.15	1.64(0.07)
Model F Statistics	4.05**	
R ²	.17	
Adjusted R ²	.13	

^aN=144 teams.

* $p < .05$

** $p < .01$

¹ For the calculation of Sobel test statistics, please refer to <http://quantpsy.org/sobel/sobel.htm> for details.

Summary of Results

A summary of the key findings from the hierarchical regression models is presented in Table 7. The hypothesis that informational diversity will positively relate to entrepreneurial team diversity was only partially supported such that functional specialty diversity can improve entrepreneurial team performance but education level and education major diversity do not appear to play significant role in entrepreneurial team performance. Mean score on openness to experience, conscientiousness, and extraversion, respectively, positively relate to entrepreneurial team performance. However, mean score on agreeableness is negatively related to entrepreneurial team performance. Diversity on conscientiousness is negatively related to entrepreneurial team performance. But diversity on agreeableness and emotional stability is positively related to entrepreneurial team performance, respectively. Shared leadership moderates the relationship between management skill diversity and entrepreneurial team performance so that management skill diversity can improve entrepreneurial team performance only when leadership is shared among team members. Regarding the mediating effects of shared leadership, shared leadership only mediates the conscientious diversity – performance link and the extraversion diversity – performance link. Chapter six discusses the theoretical and practical implications of these findings.

Table 7

Summary of Key Findings

<i>Hypotheses</i>	<i>Findings</i>
<i>Informational diversity and entrepreneurial team performance</i>	
H1: Informational diversity will positively relate to entrepreneurial team performance.	Partially supported for functional diversity
<i>Personality mean score and entrepreneurial team performance</i>	
H2a-I: A team's mean score on openness to experience will positively relate to entrepreneurial team performance.	Supported
H2b-I: A team's mean score on conscientiousness will positively relate to entrepreneurial team performance.	Supported
H2c-I: A team's mean score on extraversion will positively relate to entrepreneurial team performance.	Supported
H2d-I: A team's mean score on agreeableness will not significantly relate to entrepreneurial team performance.	Not supported
H2e-I: A team's mean score on emotional stability will positively relate to entrepreneurial team performance.	Not supported
<i>Personality diversity and entrepreneurial team performance</i>	
H2a-II: Openness to experience diversity will negatively relate to entrepreneurial team performance.	Not supported
H2b-II: Conscientiousness diversity will negatively relate to entrepreneurial team performance.	Supported
H2c-II: Extraversion diversity will positively relate to entrepreneurial team performance.	Not supported
H2d-II: Agreeableness diversity will positively relate to entrepreneurial team performance.	Supported
H2e-II: Emotional stability diversity will positively relate to entrepreneurial team performance.	Supported
<i>Moderating and mediating effects of shared leadership</i>	
H3: Shared leadership will positively relate to entrepreneurial team performance.	Supported
H4: Shared leadership moderates the relationship between informational diversity and entrepreneurial team performance such that the relationship will be significantly stronger in teams with a high degree of shared leadership.	Partially supported for skill diversity
H5a: Shared leadership mediates the relationship between team openness to experience diversity and entrepreneurial team performance.	Not supported
H5b: Shared leadership mediates the relationship between team conscientiousness diversity and entrepreneurial team performance.	Supported
H5c: Shared leadership mediates the relationship between team extraversion diversity and entrepreneurial team performance.	Supported
H5d: Shared leadership mediates the relationship between team agreeableness diversity and entrepreneurial team performance.	Not supported
H5e: Shared leadership mediates the relationship between team emotional stability diversity and entrepreneurial team performance.	Not supported

CHAPTER 6

DISCUSSION

Many significant findings emerged from this study. Functional specialty diversity can improve entrepreneurial team performance. Management skill diversity can improve entrepreneurial team performance only when leadership is shared among team members. Education level and education major diversity do not appear to play significant roles in entrepreneurial team performance. Shared leadership improves entrepreneurial team performance and it also moderates the relationship between management skill diversity and entrepreneurial team performance. Team members' personalities matter; the effects of personality on entrepreneurial team diversity differ across the Big-5 personality traits. Mean score on openness to experience, conscientiousness, and extraversion positively relate to entrepreneurial team performance. However, mean score on agreeableness is negatively related to entrepreneurial team performance. Diversity on conscientiousness is negatively related to entrepreneurial team performance. But diversity on agreeableness and diversity on emotional stability are positively related to entrepreneurial team performance. Shared leadership only mediates the conscientious diversity – performance link and the extraversion diversity – performance link.

This chapter discusses the results that relate to the study's research questions. Following a discussion of the findings for each of the three questions and a brief summary of conclusions, the chapter addresses implications for existing research, practice, and education, provides directions for future research, and reviews the limitations of the study.

Discussion of Research Questions

The primary issue of this study is when and how team informational diversity and personality diversity might enhance entrepreneurial performance. This issue is an important one,

since the composition of entrepreneurial teams is traditionally viewed as a fundamental factor that shapes consequent performance of start-ups competing in rapidly changing, highly competitive markets. Despite widespread interest in entrepreneurial teams and in shared leadership, the mechanism that links team diversity and entrepreneurial team performance has not been examined both theoretically and empirically. The purpose of this study is to examine the effect of shared leadership on the relationship between entrepreneurial team informational and personality diversity and performance. To address this issue, the researcher attempted to answer the following questions:

Research question 1: What is the relationship between entrepreneurial team diversity and team performance?

Research question 2: What is the effect of shared leadership on entrepreneurial team performance?

Research question 3: What is the role of shared leadership in the relationship between team diversity and entrepreneurial team performance?

Research Question 1

This question addresses the relationship between team diversity and entrepreneurial team performance. In other words, this question asked whether entrepreneurial teams would perform better if team members were diverse. The literature review presented in Chapter 2 indicates that different theories have different predictions regarding the diversity-performance relationship. This study addressed this question by examining the effects of two types of diversity, informational diversity and personality diversity.

Informational diversity. In this study, informational diversity was hypothesized to be positively related to entrepreneurial team performance. The results, however, only partially supported this hypothesis, such that functional diversity but not educational level, educational background, and skill diversity had a positive relationship with entrepreneurial team performance. This result is consistent with Joshi and Roh's (2009) findings that task-oriented diversity (e.g. functional diversity) had a more substantial positive effect on team performance. Foo et al. (2005) also claimed that diversity related to task factors was beneficial for team performance while diversity related to nontask factors wasn't. Compared with educational diversity, functional diversity and skill diversity would likely be more closely related with entrepreneurial tasks at hand because entrepreneurial teams need members from different functional areas and with diverse skills to deal with tasks of high complexity. However, an insignificant relationship between skill diversity and entrepreneurial team performance emerged in this study. This issue will be discussed in detail with regard to the moderating effect of shared leadership later in this chapter. Overall, the findings show that informational diversity accounts for 12% of the variation in entrepreneurial team performance.

Personality mean score and diversity. Although there is considerable research addressing the relationship between personality and team performance (Hackman, 1987; Neuman et al., 1999), little consensus has been achieved regarding which traits affect team performance. One explanation of this disagreement is that researchers have failed to consider the impact of task type, which is critical in determining the personality-team performance relationship (Hackman, 1987). Operationalizing personality in terms of personality mean score and personality diversity, this study explored the impact of personality traits on team performance for entrepreneurial tasks.

The findings show that mean score on openness to experience appeared to be a strong predictor of entrepreneurial team performance ($\beta=.37$, $p< .01$). Given the features of entrepreneurial tasks, this finding is not surprising. Openness to experience is related to creativity (Feist, 1998), coping well with change (Judge et al., 1999), and capability of adapting to the environment (LePine, 2003). The hypothesis that diversity on openness to experience is negatively related to entrepreneurial team performance, however, was not supported. An explanation of this insignificant relationship might be that entrepreneurial team members often join the team with similar motivations; therefore the negative effects of openness diversity on team process may be less problematic than traditional group research would suggest (Beckman et al., 2007).

Mean score on conscientiousness was positively related to entrepreneurial team performance. The findings are consistent with previous research that conscientiousness is a strong predictor of job performance across different job types at the individual level (Hurtz & Donovan, 2000; Salgado, 2003). This study provides evidence that conscientiousness is a good predictor of performance at the team level too. To successfully deal with the unambiguous, unstructured, and complex entrepreneurial tasks, each of the team members needs to be high on conscientiousness. The hypothesized negative relationship between conscientiousness diversity and entrepreneurial team performance was also supported. This result supports previous research (e.g., Barrick et al., 1998) and extends the finding to entrepreneurial teams providing evidence that each team member requires to possess acceptable levels of work effort and performance.

As hypothesized, the mean score on extraversion was positively related to entrepreneurial team performance. The findings of the positive effect of mean score on extraversion were in line with previous research that the characteristics of extraverts result in a positive attitude towards

teamwork (Barrick et al., 1998; Barry & Stewart, 1997) and high performance expectations (Barry & Stewart, 1997). More importantly, entrepreneurial teams with higher mean scores on extraversion are more likely to stimulate discussion (Mohammed & Angell, 2003; Taggar, 2002) and to express different ideas (Barry & Stewart, 1997). This freedom of expression is critical for creativity, decision making, and entrepreneurial team performance. However, the hypothesized positive effect of extraversion diversity on entrepreneurial team performance was not supported. One possible explanation might be that most entrepreneurial tasks require a great deal of interaction with other people, such as public relations and sales. Therefore, it is possible that a high average level of extraversion is more important than extraversion diversity for entrepreneurial teams. Another possible reason for the insignificant relationship between extraversion diversity and entrepreneurial team performance might be the small sample size in this study.

The hypothesis that the team mean score on agreeableness is not related to entrepreneurial team performance was not supported. Instead, mean score on agreeableness was found to be negatively related to entrepreneurial team performance ($\beta = -.29$, $p < .01$). This finding is contradictory with the work of Neuman and colleagues (1999), who found positive relationships between group agreeableness and performance in a large retail organization, and with the work of Halfhill and colleagues (2008), who also found such positive relationships in military action teams. The diversity on agreeableness, however, was positively related to entrepreneurial team performance, supporting the hypothesis. These two findings appear functionally congruent because entrepreneurial teams conduct conflict and lower mean score and high diversity on agreeableness helps team members challenge old ideas and stimulate new perspectives.

Contrary to expectations, team mean score on emotional stability was not positively related to entrepreneurial team performance. A possible reason for this finding might be that emotional stability is too broad a concept to capture the relevant dynamic. One argument for the positive effect of team emotional stability on entrepreneurial team performance is that team members with high scores on this trait may easily deal with high physical and psychological stress produced by the work environment, workload, work-family conflict and financial risk of starting and running a new business. It may be that the ability of dealing with stress is better captured by the more specific personality facet ‘anxiety’ (Costa & McCrae, 1992), instead of by the more generic trait of emotional stability. As expected, the hypothesized positive effect of emotional stability diversity was supported.

Taken together, the results of the current study suggest that it is important to consider both the mean score and diversity score of team members’ personality traits when making entrepreneurial team member selection decisions.

Research Question 2

The second research question of this study addresses the relationship between shared leadership and entrepreneurial team performance. Although the importance of shared leadership has been suggested by researchers (Gibb, 1954; Katz & Kahn, 1978), leadership behavior of individual leaders is still the primary focus of most team leadership research (Kozlowski & Bell, 2003). In addition, although the effect of shared leadership has been studied in different settings (Avolio et al., 1996; Pearce & Sims, 2002; Ensley et al., 2006), the results remain inconclusive.

The findings of this study extend previous research suggesting positive effects of shared leadership to the context of entrepreneurial teams. Previous research suggested that shared

leadership was more appropriate for certain types of knowledge work characterized as interdependent, creative, and complex (Pearce, 2004; Carson et al., 2007). Because entrepreneurial tasks are typically characterized by these features, a positive relationship between shared leadership and entrepreneurial team performance was hypothesized in this study. The hypothesis was supported by the results. After controlling for informational diversity, team mean personality score, and personality diversity, shared leadership was shown to be significantly related to entrepreneurial team performance ($\beta=.20$; $p<.01$).

The finding that shared leadership improved entrepreneurial team performance does not suggest that shared leadership is necessarily better than vertical leadership. Indeed, as was shown in an O'Toole, Galbraith, & Lawler (2002) study, some of the most visible examples of shared leadership have ended in failure. Therefore, a pertinent the question is when shared leadership is better than vertical leadership. This requires more future theoretical and empirical studies.

Research Question 3

The third research question was to investigate the moderation and mediation effects of shared leadership on the diversity-performance relationships. In general, the results supported the statements that shared leadership moderates the relationship between informational diversity and entrepreneurial team performance, and mediates the relationship between personality diversity and entrepreneurial team performance.

The literature review presented in Chapter 2 indicates that research on the relationship between informational diversity and entrepreneurial team performance remains inconclusive. Current theoretical frameworks, such as social categorization theory, attraction-selection-attrition theory, as well as an information and decision making perspective, appear to be insufficient for

resolving the mixed findings regarding the informational diversity – performance link. The findings of this study, however, provided evidence that shared leadership may provide a context within which entrepreneurial teams could benefit from the diversity team members bring. The results in Chapter 5 suggested that when team members could share leadership influence, the entrepreneurial teams benefited more from skill diversity. On the contrary, when teams could not share leadership, skill diversity actually harmed entrepreneurial team performance. This finding is important because previous research adopted an upper-echelon theory perspective including an assumption that informational diversity benefits team performance by providing different ideas, creativity and perspectives. But it seems that it is not enough to just bring people with diverse backgrounds together; it is also necessary for entrepreneurial teams to develop strong internal leadership patterns to bolster effectiveness. But researchers should interpret this finding cautiously. In this study, informational diversity was measured on four dimensions, namely education level diversity, education specialty diversity, functional diversity, and skill diversity. Beside the significant direct effect of functional diversity, the significant moderating effect of shared leadership was only found on the skill diversity – entrepreneurial team performance link. This result could be better understood with Joshi and Roh's (2009) framework of task-oriented diversity versus relationship-oriented diversity. Functional diversity and skill diversity may engage entrepreneurial tasks more directly than educational diversity and therefore have a more substantial positive effect on team performance.

The findings of this study also answered research question 3 regarding the mediating effects of shared leadership. This study found that the personality diversity – entrepreneurial team performance relationship was mediated by the level of shared leadership among team members, a missing link in prior literature. More specifically, this study found that shared

leadership mediated the conscientiousness diversity – entrepreneurial team performance link and the extraversion diversity – entrepreneurial team performance link. This finding is an important one because the dispositional antecedents of shared leadership had not been studied, although personality traits have been shown to be related to an individual's leadership behavior (Judge et al., 2002). It is not surprising that the mediation effects of shared leadership were found in the conscientiousness diversity – entrepreneurial team performance link and the extraversion diversity – entrepreneurial team performance link, since conscientiousness and extraversion are the two traits most strongly related to the emergence of leadership at the individual level (Judge et al., 2002).

The mediation effects of shared leadership were not supported for openness to experience, agreeableness, and emotional stability. Shared leadership was hypothesized to mediate these personality diversity – entrepreneurial team performance links because team members who are diverse on these personality traits may assume leadership roles that could complement one another so that some members may assume relationship-oriented leadership roles while others may display more task-oriented leadership roles. The possible reason that these hypotheses were not supported might be the way shared leadership was measured in this study. In the current study, shared leadership was measured as a mutual leadership influence among team members, which may not capture the different leadership behaviors, such as relationship-oriented and task-oriented leadership.

Contributions and Limitations

Through a refined theoretical framework, this study makes several contributions to the entrepreneurship literature, shared leadership literature, group research and cross-cultural research, as well as offering implications for policy makers and practitioners.

Contribution to Entrepreneurship Research

Research on diversity has paid little attention to personality differences among team members in work settings, especially in entrepreneurial teams. In the entrepreneurship literature, many studies, adopting upper echelons theory, have looked into the potential effects of top management team demographic diversity, such as age, gender, race, tenure, and functional experience diversity, but ignored the effect of team personality diversity. The literature review presented in Chapter 2 indicates that no empirical study was found that examined the relationship between personality diversity and entrepreneurial team performance. This study contributes to the entrepreneurship literature by addressing this research gap. Moreover, this study goes beyond general personality diversity by theorizing and investigating the effects of personality diversity for each of the Big-5 dimensions. That is, findings of this study show that personality diversity of different personality traits had different relationships with entrepreneurial team performance. More specifically, this study found that conscientiousness diversity negatively related to entrepreneurial team performance but agreeableness diversity and emotional stability diversity positively related to entrepreneurial team performance.

This study contributes to the entrepreneurship literature also by opening the “black-box” between personality diversity and performance. One research gap in the entrepreneurial team research is the lack of studies focusing on process variables to understand the performance effect of team diversity. Studies of top management teams relying on upper echelons theory have been criticized for overlooking the “black-box” between diversity and performance (Lawrence, 1997). To fill this research gap, this study explored not only the relationship between personality diversity and entrepreneurial team performance but also the mechanism through which this relationship occurs. Specifically, this study examined the mediation effects of shared leadership

on the personality diversity – entrepreneurial team performance link and found that personality differences among team members affected entrepreneurial team performance by developing shared leadership in the team.

Findings of this study have implications for other types of entrepreneurial teams too. Although the sample of the current study was limited to entrepreneurial teams in a university based incubator in China, whose ownership structure were mainly limited partnerships, in which certain limited partners relinquish their ability to manage the business in exchange for limited liability for the partnership's debts, it is reasonable to extend findings of the current study to other types of entrepreneurial teams with different ownership structures. This study focused on the team input (informational diversity and personality diversity), team process (shared leadership), and entrepreneurial team performance, and it is reasonable to assume that the team process is similar among entrepreneurial teams with different legal ownership structures. Furthermore, the effects of diversity and shared leadership on entrepreneurial team performance could also be extended to entrepreneurial teams in family businesses. Entrepreneurial team composition may play an important role in family business succession, as a team composition that worked well for one generation can quickly turn dysfunctional in the next. However, this implication calls for more future research.

Contribution to Shared Leadership Research

This study's contributions to shared leadership research are two-fold. First, the study provided empirical support for the positive effect of shared leadership on team performance, especially for entrepreneurial teams. In addition, the finding that shared leadership moderated the relationship between informational diversity and entrepreneurial team performance extends both the group and team research and the shared leadership research by providing insights regarding

when shared leadership might be better than individual leadership (Ensley et al., 2006). The findings suggested that when the tasks a new venture faces are complex, shared leadership is desirable.

The study also contributes to shared leadership research by examining the dispositional antecedents of shared leadership. Although the importance of shared leadership in working teams has now been established (Ensley et al., 2002; Pearce & Sims, 2002), much detail remains to be explored about under what conditions shared leadership is more likely to develop. In the literature, some antecedent conditions for shared leadership have been studied, including the overall team environment (shared purpose, social support, and voice) and team coaching (Carson et al., 2007). However, this study focused on the situational factors of the team, and team members' dispositional factors, such as personality traits, have not been examined in the literature. Therefore, this study contributes to the shared leadership literature by exploring the possible relationship between personality diversity among team members and shared leadership.

Contribution to Group Research

This study also contributes to group research. Although the effect of diversity has been widely studied in groups and teams research, most of the studies were conducted in the laboratory rather than in the field. Bell's (2007) meta-analysis provides evidence that the effect of diversity would differ between lab studies and field studies and requests more future research in field settings. Therefore, this study provides empirical evidence regarding the diversity effects in the field, specifically in the context of entrepreneurial teams.

There are different theoretical perspectives regarding the relationship between diversity and team performance. While diversity may create value and benefit for team outcomes because of a broader range of expertise and perspectives from team members (Cox et al., 1991), diversity

also could create poor social integration and cohesion and thus poor performance for teams (Pfeffer, 1983). The empirical studies have provided inconsistent and inconclusive results regarding the performance effect of team diversity. This study contributes to group research by examining the role of shared leadership on the relationship between diversity and team performance. The findings that diversity on different personality traits had different effects on entrepreneurial team performance, and the findings that shared leadership mediated these relationships, demand more research, especially experimental research to test the causal relationships.

Contribution to Cross-Cultural Research

By choosing a Chinese sample, findings of the current study add to the literature beyond those found in developed economies in which team diversity and shared leadership constructs and their performance implications have largely been the focus. As an emerging market in the world economy, China has attracted much interest from business and academia. However, entrepreneurship literature has paid only limited attention to this area of development (Yang & Li, 2008). Therefore, although it is beyond the scope of this study to compare developed and transitional economies, the findings add to understanding team diversity, shared leadership, and entrepreneurial teams within Chinese new ventures.

Practical Implications

Besides potential theoretical contributions, the study also has important implications for policy makers and practitioners. First, this study provides policy implications for government agencies, foundations, and universities who provide support for start-ups in incubators. These institutions should know the importance of entrepreneurial team composition and team process to start-up performance and should provide entrepreneurial teams support in team development.

Second, the study provides entrepreneurs with implications regarding team member selection. One practical and important question the leading entrepreneur must answer when creating the entrepreneurial team is whom he/she wants to select as partners. The findings suggest that entrepreneurial team founders should select team members with diverse functional experience and management skills. Also, to really benefit from the informational diversity team members bring, entrepreneurial teams should share leadership; that is, each team member should be willing and have the capability to assume leadership roles when tasks require. Finally, entrepreneurial teams can promote shared leadership by selecting team members who have a good “fit” regarding personality traits.

Limitations

It is important to consider the limitations of this study when interpreting the findings. The university based sample frame may be one limitation in regard to the generalizability of the results. The sample was from a single university incubator and not a random sample. However, there is no reason to believe that the results of the study will not generalize to other Chinese university incubators. The sample of the current study was also limited to entrepreneurial teams with a limited partnership structure, in which certain limited partners relinquish their ability to manage the business in exchange for limited liability for the partnership's debts. Furthermore, since only new start-ups were considered in the current study, it was limited in the extent to which the findings could be generalized to later stages of new ventures. It may be that the relative importance of vertical versus shared leadership is dependent on the stage in the development of the organization (Ensley et al., 2006). Therefore, it might be useful to examine the relationships among team diversity, shared leadership and entrepreneurial team performance longitudinally across various stages in the entrepreneurship life cycle.

Future Research Directions

Findings of this study suggest several future research directions for group research, entrepreneurship research and shared leadership research. First, this study encourages future research to focus on doing more longitudinal studies. The cross-sectional nature of the research design does not allow us to draw causal conclusions. One study found that effects of team diversity on team performance have a temporal element; the effects of diversity based on attitude and personality increase with time (Harrison et al., 1998). Hence, future research that adopts a longitudinal approach can refine the current findings. Moreover, future research necessitates the adoption of other performance measures (e.g. innovation, profitability, and revenue) that are applicable to different stages of venture development.

Second, findings of this study suggest that shared leadership mediates that personality – entrepreneurial team performance link. However, more experimental studies are necessary to establish this causal relationship. Especially, experimental studies that explores whether different personality configuration across team members will facilitate the development of shared leadership would contribute to the understanding of shared leadership dynamics. As this study focused on entrepreneurial teams dealing with entrepreneurial tasks, additional research could explore the effects of personality diversity on shared leadership with other types of teams. Differences in task types may result in variation in the amount of communication, coordination, and technical demands (Sundstorm, DeMeuse, & Futrell, 1990). The manipulation of different tasks may provide further insight into the role of personality diversity on shared leadership.

Third, the study examined the relationship among team personality diversity, shared leadership, and entrepreneurial team performance using a variable approach – assessing the isolating personality traits' impact on entrepreneurial team performance. It may overlook the

possibility that the Big-5 personality traits together affect entrepreneurial behavior. "Configurations are inherently multidimensional entities in which key attributes are tightly interrelated and mutually reinforcing (Dess, Newport, & Rasheed, 1993, p. 784)." Recent approaches emphasize patterns and interrelations within a broader set of configuration areas (Davison & Davenport, 2002). For example, using the configuration approach, Dilchert (2007) investigated the relationship between personality profile and leadership and managerial interests. Therefore future research adopting a configuration approach or pattern-oriented approach can be used to offer insights into team personality – performance relationship. Moreover, future research also needs to identify the best team composition for a given entrepreneurial team. This line of research will be practically important for leading entrepreneurs to build effective entrepreneurial teams.

In addition, another direction for future research is to understand team diversity, shared leadership, and entrepreneurial team performance with a cross-cultural design. Since this study focused on the dispositional factors such as personality traits, future research is demanded to explore the effects of situational factors on the diversity – shared leadership – team performance link.

Conclusion

The increasing use of entrepreneurial teams in new ventures necessitates that researchers explore the relationship between team composition and entrepreneurial team performance, especially the conditions under which and the mechanisms through which team diversity might benefit performance. Using a sample in a technology incubator in China, this dissertation found many significant findings, providing initial evidence on the moderating and mediating effects of shared leadership on the relationships between team diversity and entrepreneurial team performance. First, functional specialty diversity can improve entrepreneurial team performance.

Management skill diversity can improve entrepreneurial team performance only when leadership is shared among team members. Second, team members' personalities matter; the effects of personality on entrepreneurial team diversity differ across the Big-5 personality traits. Mean score on openness to experience, conscientiousness, and extraversion positively relate to entrepreneurial team performance. However, mean score on agreeableness is negatively related to entrepreneurial team performance. Diversity on conscientiousness is negatively related to entrepreneurial team performance. But diversity on agreeableness and diversity on emotional stability are positively related to entrepreneurial team performance. Third, shared leadership mediates the conscientious diversity – performance link and the extraversion diversity – performance link. These findings advance research in entrepreneurship, groups and teams, and shared leadership. While further data is required to base knowledge on even stronger empirical evidence, the study provides practical implications for entrepreneurs on how to select team members and how to build effective entrepreneurial teams.

Appendix A: Measurement of Variables (English Version)

Personal Data

1. The initials of your firm's name: _____
2. Your position or title at the firm: _____
3. Your gender:
 - (1) Male
 - (2) Female
4. Your age: _____
5. Please indicate your highest earned degree:
 - (1) No high-school diploma
 - (2) High-school graduate
 - (3) College graduate
 - (4) Master degree
 - (5) Doctoral degree
6. Please indicate your educational specialty:
 - (1) Education
 - (2) Humanities and Arts
 - (3) Social science, business and law
 - (4) Science
 - (5) Engineering, manufacturing and construction
 - (6) Agriculture
 - (7) Health and welfare
 - (8) Services
 - (9) Not known or unspecified
7. Please identify the functional areas that you have expertise in:
 - (1) Marketing
 - (2) Sales/customer service
 - (3) Finance/accounting,
 - (4) General management
 - (5) Human resources/personnel
 - (6) Information technology
 - (7) R&D

(8) Administrative support

(9) Operations/distribution/logistics

8. Please rate your skill level on each of the following seven items from “1” as “Not Effective” to “5” as “Extremely Effective.

(1) Product design

(2) Industry analysis

(3) Organizational design

(4) Motivating employees

(5) Creating a sphere of influence

(6) Planning and administration

(7) Discovering opportunities

9. Please indicate the percentage of ownership you hold in this firm: _____%.

Personality Traits

NEO PI-R 60 items of Costa and McCrae's (1992) five NEO domains

1. I am not a worrier.
2. I like to have a lot of people around me.
3. *I don't like to waste time daydreaming.*
4. I try to be courteous to everyone I meet.
5. I keep my belongings neat and clean.
6. *I often feel inferior to others.*
7. I laugh easily
8. *Once I find a way to do something, I stick to it.*
9. *I often get into arguments with my family and coworkers.*
10. I'm pretty good about pacing myself so as to get things done on time.
11. When I'm under a great deal of stress, sometimes I feel like I'm going to pieces.
12. *I don't consider myself especially "light-hearted".*
13. I am intrigued by the patterns I find in art and nature
14. Some people think I'm selfish and egotistical
15. *I am not a very methodical person.*
16. I rarely feel lonely or blue.
17. I really enjoy talking to people.
18. I believe letting students hear controversial speakers can only confuse and mislead them.
19. *I would rather cooperate with others than compete with them.*

20. I try to perform all the tasks assigned to me conscientiously.
21. I often feel tense and jittery.
22. I like to be where the action is.
23. Poetry has little or no effect on me.
24. *I tend to be cynical and skeptical of others' intentions.*
25. I have a clear set of goals and work toward them in an orderly fashion.
26. Sometimes I feel completely worthless.
27. *I usually prefer to do things alone.*
28. *I often try new and foreign foods.*
29. *I believe that most people will take advantage of you if you let them.*
30. I waste a lot of time before settling down to work.
31. I rarely feel fearful or anxious.
32. I often feel as if I'm bursting with energy.
33. I seldom notice the moods or feelings that different environments produce.
34. *Most people I know like me.*
35. I work hard to accomplish my goals.
36. I often get angry at the way people treat me.
37. I am a cheerful, high-spirited person.
38. *I believe we should look to our religious authorities for decisions on moral issues.*
39. *Many people think of me as somewhat cold and calculating.*
40. When I make a commitment, I can always be counted on to follow through.
41. Too often, when things go wrong, I get discouraged and feel like giving up.
42. *I am not a cheerful optimist.*
43. Sometimes when I am reading poetry or looking at a work of art, I feel a chill or wave of excitement.
44. *I'm hard-headed and tough-minded in my attitudes.*
45. Sometimes I'm not as dependable or reliable as I should be.
46. I am seldom sad or depressed.
47. My life is fast-paced
48. I have little interest in speculating on the nature of the universe or the human condition.
49. I generally try to be thoughtful and considerate.
50. I am a productive person who always gets the job done.
51. I often feel helpless and want someone else to solve my problems.
52. I am a very active person.
53. I have a lot of intellectual curiosity.
54. If I don't like people, I let them know it.
55. I never seem to be able to get organized.

56. At times I have been so ashamed I just wanted to hide.
57. I would rather go my own way than be a leader of others.
58. I often enjoy playing with theories or abstract ideas.
59. If necessary, I am willing to manipulate people to get what I want.
60. I strive for excellence in everything I do.

Team Effectiveness Questionnaire

Please indicate the degree to which you agree the following statements about your team (1 = Strongly Disagree; 5 = Strongly Agree):

1. The team delivers its commitments on time.
2. The team is highly effective at implementing solutions.
3. The team delivers important changes.
4. The team performs duties accurately and consistently.
5. The team eliminates root problems, not just symptoms.
6. The team faces new problems effectively.
7. The team changes behavior to meet the demands of the situation.
8. The team copes with change very well.
9. The team sets goals and priorities for maximum efficiency.
10. The team develops workable plans.
11. The team works on important problems.
12. The team proactively communicates its progress.
13. The team keeps everyone informed on its progress.
14. The team is highly effective.
15. The team is making very good progress on the team's charter.
16. The team does a very good job.

Shared Leadership

Please rate each of our team members (1, "not at all," to 5, "to a very great extent") on the following question:

To what degree does your team rely on this individual for leadership?

Firm Data

1. What industry are you doing business?
(1) High-technology industry (2) Low-technology industry
2. How many peers are in your entrepreneurial team? _____

Appendix B: Measurement of Variables (Chinese Version)

个人数据

1. 您公司的首字母缩写是: _____
2. 您在公司的职务是: _____
3. 您的性别:
 - (1) 男
 - (2) 女
4. 您的年龄: _____
5. 请选择您所取得的最高学位:
 - (1) 高中以下
 - (2) 高中毕业
 - (3) 大学
 - (4) 硕士
 - (5) 博士
6. 请选择您所学的专业:
 - (1) 教育学
 - (2) 人文艺术
 - (3) 社会科学、商业管理和法律
 - (4) 自然科学
 - (5) 工程、建筑和制造
 - (6) 农业
 - (7) 医学
 - (8) 服务
 - (9) 不清楚
7. 请选择您的专业特长:
 - (1) 市场营销
 - (2) 销售、客户服务
 - (3) 财务会计
 - (4) 一般管理
 - (5) 人力资源管理
 - (6) 信息科技
 - (7) 研究与开发
 - (8) 管理支持
 - (9) 生产运营管理
8. 请对您的以下七项技能水平依次打分 (1 = 低 ; 5 = 高) :
 - (1) 产品设计
 - (2) 行业分析

- (3) 组织设计
- (4) 员工激励
- (5) 影响力
- (6) 计划与管理
- (7) 发现机会

9. 您在贵公司所持有的股份比例是: _____%.

性格测试

NEO PI-R 60 items of Costa and McCrae's (1992) five NEO domains

1. 我不是一个容易忧虑的人
2. 我喜欢很多人在我身边
3. 我不喜欢将时间浪费在白日梦中
4. 我尽量对我所碰见的每个人都以礼相待
5. 我通常保持我的物件干净、整洁
6. 我经常感到自己不如别人
7. 我容易发笑
8. 一旦我找到了做事的适当方法, 我便会一直照这种方法做下去
9. 我经常与家人及同事争论
10. 我善于计划时间安排要做的事情, 以至能够及时完成工作
11. 我在大量压力的情况, 有时感到精神象是要崩溃一样
12. 我并不觉得自己特别轻松愉快和乐观开朗
13. 我深感艺术和自然所呈现出的各种格调和姿态奇妙有趣
14. 有时候, 我的一些做法使别人认为我太顾自己或自我中心
15. 我不是一个做事有条不紊的人
16. 我很少感到孤独和忧郁
17. 我确实喜欢与别人交谈
18. 我难以想象我会与一个说话带有乡音的人成为好朋友
19. 我情愿与别人合作而不愿与他们竞争
20. 我尽心尽力地执行一切分派给我的任务
21. 我常感到紧张和心神不定
22. 我喜欢去热闹的场所
23. 我很少或不会因诗词而产生什么感触
24. 我认为人们表面上说得漂亮, 内心则另有我谋
25. 我有明确的目标, 并能有条不紊地为实现此目标而工作
26. 有时我感到自己毫无价值
27. 我通常喜欢单独工作
28. 我经常品尝我没吃过的和异地风味的食物
29. 我认为如果你任别人怎样对待你, 许多人便会趁机利用你

30. 我在安顿下来工作之前要浪费掉不少时间
31. 我很少感到恐惧或焦虑
32. 我常常感到精力旺盛
33. 我很少注意不同处境对我的心境或感受的影响
34. 我所认识的大部分人都喜欢我
35. 我努力工作以达成我的目标
36. 我常因别人对我不好而感到愤怒
37. 我是一个快乐、生气勃勃的人
38. 我认为在道德问题上做决定时，我们应遵从宗教权威的判断
39. 我有些冷淡而有心计
40. 当我作出承诺后，我总是能够照着去做
41. 我经常在事情不顺利时感到挫折并想因此而放弃
42. 我不是一个乐观主义者
43. 当我阅读一首诗或观看一件艺术品时，我有时会感到兴奋或惊喜
44. 当我在电影或电视中见到一家人悲欢离合的镜头时，我会感动得流出眼泪
45. 我有时没有象我所应该的那样可靠和值得信赖
46. 我很少感到忧郁或沮丧
47. 我的生活节奏很快
48. 我没有兴趣思索宇宙的本质或人类的现状
49. 我通常尽可能深思熟虑
50. 我是一个总是能够将事情办妥和有工作成效的人
51. 我经常感到无能为力
52. 我是一个很活跃的人
53. 我有很强的求知欲望
54. 如果我不喜欢某人，我便会让对方知道
55. 我好像总不能把事情安排得井井有条
56. 有好几次我羞愧得只想躲起来
57. 我宁愿我行我素也不愿成为别人的领导
58. 我对理论和抽象的观念很感兴趣
59. 如有必要，我愿意操纵别人以得到我所想得到的
60. 我尽量将我所干的一起事情都干得出色

Team Effectiveness Questionnaire

您在多大程度上同意以下关于您所在的创业团队的表述：(1 = 完全不同意；5 = 完全同意):

1. 创业团队能够按照承诺完成各项任务。
2. 创业团队能够高效率地执行计划。
3. 创业团队能够随机应变。

Firm Data

1. 贵公司所在的行业是否为高科技行业：
(1) 是 (2) 否
2. 您的创业团队共有多少人？ _____ 人

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