EFFECTS OF VENTURE TEAM DEMOGRAPHIC CHARACTERISTICS ON TEAM INTERPERSONAL PROCESS EFFECTIVENESS IN COMPUTER RELATED VENTURE TEAMS

DISSERTATION

Presented to the Graduate Council of the University of North Texas in Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Manju Ochani, B.Com. (Hons.), M.B.A.

Denton, Texas

August, 1996
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In order to remain competitive, firms must be able to merge diverse, differentiated people into teams. In comparison to solo ventures, venture teams not only offer a broader base of physical and financial resources and varying points of view, but also positively influence the profitability, growth, and survivability potential of new ventures. Despite the growing importance and potential benefits offered by venture teams, relatively little is known about assembling and maintaining effective venture teams in the field of entrepreneurship. More specifically, information is needed to understand what composition and combination of demographic characteristics of team members would contribute to the effectiveness and success of a venture team. In this study the relationship between venture team demographic characteristics and team effectiveness (which is defined in terms of the interpersonal process of venture team members in their group activities) is investigated. The demographic characteristics examined include average age, age heterogeneity, average level of education, educational background heterogeneity, gender heterogeneity, and functional background heterogeneity.

A field study, involving face-to-face and telephone interviews with the venture teams is used to gather data from 40 computer related venture teams in a large midwest U.S. city. The venture teams are identified through the local Chambers of Commerce, peer referrals, and library research. Information is gathered on demographics and team
interpersonal process effectiveness using a pre-validated instrument. Data are analyzed using regression analysis.

The results indicate that average age negatively and significantly relates with team interpersonal process effectiveness. Furthermore, average level of education positively and significantly relates with team interpersonal process effectiveness. The other demographic variables, age heterogeneity, educational background heterogeneity, gender heterogeneity, and functional background heterogeneity do not produce significant relationships.
I wish to thank the many individuals who have made this dissertation possible. I am grateful to my Chair, Dr. Louis D. Ponthieu, who has been a mentor to me in the true sense of the word. I sincerely appreciate the support and guidance he has provided over the years. I am also indebted to my other committee members--Dr. Michael Beyerlein, Dr. Barbara Coe, Dr. Alan Kvanli, Dr. Mary Thibodeaux, and Dr. Warren Watson. Your support and encouragement has been invaluable.

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CHAPTER I

INTRODUCTION

Change in the competitive environment has altered the nature of business, and in order to remain competitive, firms must engage in the continuous process of learning and renewal. Waterman (1987) suggests that firms must continuously reorganize themselves to break down bureaucratic barriers; they must also increase communication between members of the organization. In order to accomplish these objectives, firms must merge their talents into groups to ensure long term survival (Slevin & Covin, 1992). Teams are increasingly being recognized as an effective means for accomplishing complex organizational tasks (Hackman, 1990). By their very nature, teams represent a more organic (rather than mechanistic) structure (Burns & Stalker, 1961). Research indicates that an organic structure is critical to entrepreneurial success (Slevin & Covin, 1990). In comparison to solo ventures, venture teams can provide a broader base of not only physical and financial resources, but also varying points of view, and ideas and talents (Hofer & Sandberg, 1987; MacMillan, Siegel, & Subbanarasingha, 1985). In addition, teams speed up product development (Nevins, Summe, & Utal, 1990), especially in dynamic environments (Bingham & Quigley, 1989; Gladstein, 1984; Hackman, 1987).

In order to remain competitive, firms must also be able to bring together diverse, differentiated people into teams. Team members, because of their diverse backgrounds, should be able to exchange information creatively to solve problems and remain
entrepreneurial (Nemeth, 1985; Reich, 1987; Shaw, 1983; Slevin & Covin, 1992; Stewart, 1989).

In a large number of studies group behavior and work group performance (e.g., Gladstein, 1984, Hackman, 1987; Watson, Kumar, & Michaelsen, 1993) have been addressed. Detailed reviews of literature on groups can be found in studies done by Bettenhausen (1991) and Shaw (1983). Although definitely pervasive, venture teams, however, have not been extensively empirically studied (Kamm, Shuman, Seeger, & Nurick, 1990; Slevin & Covin, 1992). Although several laboratory studies related to teams have been conducted in the past, the increasing entrepreneurial use of venture teams calls for more field research (Slevin & Covin, 1992; Watson, et al., 1993), especially related to venture teams (Watson, Ponthieu, & Critelli, 1995).

Venture capitalists rarely consider business proposals of single individuals; rather the experience and skills of the entire venture team are key considerations (Kamm et al., 1990). Research is, hence, needed about assembling and maintaining effective entrepreneurial venture teams (Kamm et al., 1990). Timmons (1979) suggests analyzing the skills and capabilities of the founder and other team members in assessing entrepreneurial potential. He recommends asking whether the skills and capabilities of team members are complementary to other members' skills and operating style.

Given these issues in assessing an entrepreneurial venture, it is important to theory and practice in the development of the field of entrepreneurial research that major issues surrounding the creation and maintenance of high-performance teams be understood. For instance, it is important to ask how to create high-performance and effective teams (Slevin
& Covin, 1992). It is also important to seek the right combination of characteristics of team members, because at the very outset, mechanisms may be installed to enhance the effectiveness and success of teams (Slevin & Covin, 1990). The characteristics of the team members determine to a large extent the effectiveness of the venture team (Slevin & Covin, 1992). Right members must be selected, based on small group dynamics issues and knowledge (Takeuchi & Nonaka, 1986).

By integrating concepts and findings from different fields, a more comprehensive understanding can develop to explain organizational outcomes (Jemison, 1981; Thomas & Moss, 1993). Given this suggestion, the central purpose of this study is to apply group based literature from the field of organizational behavior and theory, and "upper echelons" and "dominant coalition" concepts from the field of organization theory and strategic management to venture teams in the field of entrepreneurship.

**Statement Of Problem**

Small firms account for 40 percent of the gross national product in the United States (Inman & Mehra, 1990). They are a critical part of the U.S. economy. A significant number of these business ventures are being started by entrepreneurial teams (Watson, et al., 1995). Almost 60 percent of the America's fastest growing businesses in 1992 were started by two or more partners (Mangelsdorf, 1992). Some researchers point out that individual entrepreneurship that was formerly encouraged, is rapidly being replaced by teams of entrepreneurs (Reich, 1987). Such team ventures offer a variety of
benefits, some of which include improved performance, growth, survivability potential and success (Cooper & Bruno, 1977; Teach, Tarpley, & Schwartz, 1986; Timmons, 1990). In spite of the growing importance and potential benefits that venture teams offer, however, very little is known about assembling and maintaining entrepreneurial teams (Kamm, et al., 1990). In the words of Bird (1989), "While there is some research on entrepreneurial teams, it is sparse, mostly anecdotal, and lacks a theoretical base" (p. 207). Kamm et al. (1990) imply that team-building may become part of a venture creation process by seeking the right kind of members. Thus, information is needed to understand what composition or combination of characteristics of team members would contribute to the effectiveness and success of a venture team.

Pfeffer (1983) pointed out that demography refers to "the composition, in terms of basic attributes such as age, sex, educational level, length of service or residence, race, and so forth of the social entity under study" (p. 303). Hambrick and Mason (1984), based on a call from Pfeffer to study demographics in organizations, made a contribution by advocating the study of demographics of "upper echelons" or the "dominant coalition" (Cyert & March, 1963) in evaluating outcomes. In response, several studies have been undertaken that examine top management team characteristics with respect to outcomes (e.g., Bantel, 1993; Bantel & Jackson, 1989; Cho, Hambrick, & Chen, 1994; Michel & Hambrick, 1992; Wiersema & Bantel, 1992). Although the findings of these studies have been significant, most of these studies have been conducted in medium to large organizations. Hambrick (1994) recommends that in order to increase explanation and prediction of these findings, future research needs to focus on small to medium sized
firms. Smaller firms offer the advantage of providing greater explanatory power (Hambrick, 1994). With some exceptions (e.g., Teach, et al., 1986), however, information relating to demographic characteristics of venture team owners (the dominant coalition/upper echelons equivalent of top management team in larger businesses) is limited.

Another important aspect relating to venture team research is identifying what constitutes effective teams (Kamm et al., 1990). There is an extensive body of research on groups that can be examined to help understand and define effectiveness in venture teams. Bird (1989, p. 207) states that "because many entrepreneurial teams are composed of individuals who are 'new' to each other (this assumes no previous venture start-ups together) and because these individuals have a common goal, entrepreneurial teams can be compared to other dyads and small groups." Consequently, findings of group research can be applied to understand venture team effectiveness.

Effectiveness in groups has been variously defined (e.g., Gladstein, 1984; Hackman, 1987, Kolodny & Kiggundu, 1980). Although there is no consensus on any single explanation, most approaches emphasize the significance of interpersonal process within the team in determining effectiveness and performance. While some work has been done to identify key issues in how well venture teams work together, there has been little in-depth research (e.g., see Watson et al., 1995) to measure specific dimensions of interpersonal process effectiveness. Furthermore, although admittedly significant, research examining the impact of demographic characteristics of venture team members on the interpersonal process effectiveness in a team has not been undertaken. Given the gap in
entrepreneurship literature, and a call for research on venture teams, the main purpose of this study is to examine the effects of demographic characteristics on team interpersonal process effectiveness. The study, thereby, is undertaken to fill two voids in the current entrepreneurship literature: (1) to fill a gap in the entrepreneurship literature on venture teams, and (2) to help prospective and current entrepreneurs form and maintain effective teams.

In the following section an overview of the literature which constitutes the theoretical foundation for this study is provided. Various issues in group and entrepreneurship research provide the basis for the research model. Ultimately, both theory and practice could benefit from having a body of literature that identifies the various characteristics and circumstances which would enhance venture team effectiveness.

**Theoretical Foundation**

Individual entrepreneurs do not always create and drive the venture process. New ventures are commonly started and run by entrepreneurial teams, whose functioning seems to affect performance. These entrepreneurial teams are responsible for many (or most) of the major start-ups (The IPO, 1989). The use of teams and work groups is gaining substantial attention and importance in firms (Goodman, Ravlin, & Schminke, 1987; Guzzo & Shea, 1992; Magjuka & Baldwin, 1991; Majchrzak, 1988). Firms in the 1990s must become much more entrepreneurial and adaptable to survive and grow in a
constantly changing environment. Reich (1987) argues that the United States economy that formerly encouraged individual entrepreneurial behavior no longer exists. Consequently, the entire organization must respond collectively to changes in the environment. Additionally, the businesses must apply their efforts collectively to remain competitive. Consistent with this idea, Cornwall and Perlman (1990) have argued that teams are an integral component of an entrepreneurial firm. Firms of the 1990s will need an increasing number of differentiated specialists who, at the same time, must be integrated towards achieving a common goal (Slevin & Covin, 1992).

Teams hold the potential for increasing productivity and satisfaction (Gladstein, 1984; Goodman, Devadas, & Hughson, 1988; Hackman, 1987; Katzell & Guzzo, 1983). Venture teams positively influence the profitability, growth, and survivability potential of new ventures (Watson et al., 1995). Cooper and Bruno (1977) found that team-based firms tend to be more financially successful than individual endeavors. Teach et al. (1986) found from a study of 237 software start-ups that only about 29 percent of the firms were started by lone entrepreneurs, and that more than two-thirds of the firms had two or more principals. Obermayer (1980) found in her study that 16 of the 23 team-based firms reached annual sales volume of $6 million or more. In another study (The IPO, 1989) it was found that team-based ventures tended to have higher revenues and net incomes than their non-team based counterparts.

Vesper (1993) suggests that teams have better odds for success than individual entrepreneurs, and that teams with a balance of talents are even more preferable.

Timmons (1990) suggests that not only is the existence of a team important, but so, too, is
the quality of the team. There is, therefore, value in getting and working with the "right"
partner or partners. The characteristics of the team members and the composition of the
team will determine, to a great extent, the effectiveness of the team (Stewart, 1989; Slevin
& Covin, 1992). Individuals with diverse backgrounds and fields of expertise must be
gathered into cooperative, coordinated small groups to remain competitive in the long run
(Reich, 1987).

In spite of the growing importance of teams, however, little has been done to
identify what it takes to assemble and maintain an effective entrepreneurial team (Kamm et
al., 1990), and how that relates to performance (Watson et al., 1995). Although
composition of the team has been recognized as having an impact on the functioning of a
team (Bantel & Jackson, 1989; Shaw, 1976; Wanous & Youtz, 1986), the importance of
composition has not been widely investigated for its impact on team effectiveness. Guzzo
& Shea (1992) indicate that when it has been investigated, the evidence has been mixed.
Overall, the general finding in this area is that when solving complex, non-routine
problems, groups are more effective when composed of individuals having a variety of
skills, abilities, knowledge, and perspectives (e.g., Gladstein, 1984; Goodman, Ravlin, &
Argote, 1986; Hackman, 1987; Pearce & Ravlin, 1987; Shaw, 1976, 1983; Wanous &
Youtz, 1986). Diversity or heterogeneity may increase team effectiveness because people
can learn from each other's perspectives (Campion, Medsker, & Higgs, 1993). The
composition of a team has a direct bearing on the kind and amount of knowledge that is
available in a team and how team members interact with each other. In fact, how a group
performs, or to what extent it is effective, is determined by how it is designed.
While diversity has been indicated to have a positive impact on the functioning of teams, there is also some evidence that heterogeneity in teams may lead to some negative outcomes. Some studies indicate that homogeneity may lead to better outcomes when satisfaction, communication, conflict (Pearce & Ravlin, 1987), and turnover (Jackson, Brett, Sessa, Cooper, Julin, & Peyronnin, 1991) are taken into consideration. All in all, it can be said that there are some benefits that arise from having diversity in teams, it is unclear, however, under what situations team diversity would have positive outcomes, and what impact that diversity has on small business teams.

In order to understand the importance of composition of a team, it is necessary to examine the demographic make-up of the team, including age, education, gender, and functional background. The size of the team has also been recognized as an important variable in determining the processes and outcomes for a team (e.g., Bantel, 1993; Bantel & Jackson, 1989; Waller & Huber, 1994; Wiersema & Bantel, 1992).

Several authors have called for more research in the field of high-technology entrepreneurship (e.g., Churchill, 1992; Maidique, 1986, Teach et al., 1986) because of the unique opportunities and circumstances it presents (e.g., high rate of job creation by small firms [Kirchhoff & Phillips, 1992], low barriers to entry and low investment, small firm size [Teach et al., 1986]). Several questions have been posed regarding high-tech entrepreneurship, some of which relate to (1) the team formation process (Churchill, 1992), (2) the factors associated with stable and effective teams (Churchill, 1992), (3) the number of founders (Maidique, 1986), (4) the number of disciplines that the founding team includes (Maidique, 1986), and (5) educational experience (Maidique, 1986).
Given the call for research on venture teams in the field of entrepreneurship, coupled with a need to examine high-tech entrepreneurial firms, in this study the effect of demographic characteristics on team interpersonal process effectiveness in computer related small business venture teams (Standard Industrial Classification number 737) is examined. For the purposes of this research, a venture team is defined as two or more individuals who jointly establish and actively participate in a business in which they have an equity interest (Kamm, 1990; Kamm & Nurick, 1993; Kamm et al., 1990; Timmons, 1990; Vesper, 1993; Watson et al., 1995). Based on the theoretical foundation briefly presented above, the attempt is to answer the following research questions:

1. What is the impact of demographic trait effects (average age, and level of education) on team interpersonal process effectiveness?

2. What is the impact of demographic diversity effects (age heterogeneity, educational heterogeneity, gender heterogeneity, and functional background heterogeneity) on team interpersonal process effectiveness?

These research questions are explored using a field study which involves face-to-face and telephone interviews with the venture team members. Information is gathered on demographics and team interpersonal process effectiveness. An instrument designed by Watson, Ponthieu, and Critelli (1995) to evaluate and measure team interpersonal process effectiveness is used for this purpose. High-tech venture teams in a large metropolitan midwest U.S. city is the target population. The subjects of analysis are business owners. The unit of analysis is the venture team. Data are gathered from all members who constitute the venture team. The firms and subjects are identified through information
provided by the local Chambers of Commerce, peer referrals, and library research.

Reliability and validity of the instrument are established with the necessary statistical tests. Data are analyzed using regression analysis.

**Significance Of Research**

Teams hold great potential for firms to improve their productivity, satisfaction, effectiveness, and competitive position in the 1990s (Campion, Medsker, & Higgs, 1993). They are gaining importance in organizations and present opportunities and threats. In the recent team and entrepreneurship literature, there has been a frequent call for more empirical research on teams (Kamm, Shuman, Seeger, and Nurick, 1990; Levine and Moreland, 1990; McGrath, 1986; Shea and Guzzo, 1987; Watson et al., 1995). Specifically, more empirical and field research is needed to confirm the generalizability of the findings from the laboratory studies undertaken in the past to actual work situations. The current acknowledgment of the need for teams in entrepreneurial ventures is indicative of the need for steps to encourage further study of teams and the various characteristics and situations that influence team effectiveness.

The attempt here is to extend previous research on venture teams and team effectiveness by examining the effect of composition factors on the interpersonal process effectiveness in venture teams. Specifically, three contributions are made, of which the first is to provide a detailed review of literature on demographic diversity factors with respect to the dimensions of team interpersonal process effectiveness as identified by
Watson et al., (1995). Second, this study is more methodologically rigorous than most previous efforts. The study uses natural teams ("those that exist independent of a researcher's activities and purposes" [McGrath, 1984]) in real world setting to study team effectiveness. The sample consists of on-going small business teams rather than the laboratory subjects or sensitivity groups used in small-group research (Goodstein & Dovico, 1979). The study is a response to the frequent call for more field as opposed to laboratory research on groups (e.g., Levine & Moreland, 1990; McGrath, 1984; Shea & Guzzo, 1987). Finally, the attempt is to examine these issues in the context of small businesses, which has not been attempted in the past.

Besides the benefits offered by this study to researchers, the study also offers implications for venture owners and practitioners. The findings of this study hold the potential to offer insight into what constitutes effective venture teams, and what, if any, value lies in manipulating the characteristics of venture team members to ensure positive interpersonal processes. Effective interpersonal process has been shown to positively relate to success in venture dyads (see Watson et al., 1995). Value, therefore, lies in studying the effect of demographics on team interpersonal process effectiveness.

**Definitions Of Terms**

A venture team is two or more individuals who jointly establish and actively participate in a business in which they have an equity (financial) interest (Kamm, 1990; Kamm & Nurick, 1993; Kamm et al., 1990; Timmons, 1990; Vesper, 1993; Watson, et al.,
Interdependence (Campion et al., 1993; Mintzberg, 1979) and financial interest (Kamm, 1990; Vesper, 1993) have been identified as defining characteristics of a team. Consequently, the team comprising owners (principals who are the main decision makers) is considered as the venture team. If a member is not involved in the routine functioning and decision making of the business (for example, a dormant partner), or does not have an equity interest, he/she is not considered a team member.

Team effectiveness is defined in terms of interpersonal process of venture team members in their group activities. This approach of team effectiveness was employed by Watson et al. (1995) to study the relationship between team interpersonal process effectiveness and venture success in venture dyads. The present study uses the same definition of team effectiveness.

Demographics are defined to include age, education, gender, and functional experience (Pfeffer, 1983). Trait as well as diversity effects of demographics (Wiersema & Bantel, 1992) are analyzed with respect to team effectiveness.

Chapter Summary

In this chapter, a synopsis of this research study is presented. After a brief introduction, the problem is stated. The theoretical foundation of the study is followed by presentation of the significance of research. Finally, the definition of terms pertaining to this study is provided.
Organization Of The Study

The organization of this study follows the functionalist paradigm toward theory building: selecting a topic, followed by a statement of research question(s), survey of the literature leading to a model and a set of hypotheses, and design of the research (Gioia & Pitre, 1990; Schendel & Hofer, 1979). In the first chapter the statement of the problem, theoretical foundation, significance of research, and definition of terms are presented.

The literature on the variables of the theoretical foundation, namely demographic factors and team interpersonal process effectiveness, is reviewed and relationships between them are established in Chapter II. The second chapter consists of a review of research on effectiveness as viewed from organizational effectiveness perspective and work group performance perspectives. Literature is also reviewed on entrepreneurial venture teams that emphasize team interpersonal processes. This is followed by a detailed discussion of demographic diversity's impact on groups and specific demographic factors in relation to team interpersonal process effectiveness. In the last section, a proposed model and derived testable hypotheses are presented.

The research design and methodology of this study are covered in Chapter III. First the issue of sampling and procedure to conduct the study are addressed. In the next section, the instruments and measures employed to study the relationship between demographic variables and team interpersonal process effectiveness are presented. Finally, the data analysis techniques are discussed.
In Chapter IV, the analysis of results are presented. First, descriptive statistics are presented. Next, the results of the hypotheses tested are discussed. Finally, a post hoc power analysis is conducted to assess the adequacy of sample size.

In the last chapter, Chapter V, a detailed discussion of the findings of the hypotheses tested is presented. Possible reasons are examined for nonsignificant findings of the regression analysis. This is followed by a detailed examination of the validity issues pertinent to this study. Next, implications of this study for both theorists and practitioners are discussed. The chapter concludes with a discussion of limitations and directions for future research.
CHAPTER II

REVIEW OF LITERATURE

This chapter is a review of the literature on demographic diversity in venture teams and team interpersonal process effectiveness. The chapter is divided into four sections. In the first section, the issue of team interpersonal process effectiveness is addressed. This section is further divided into sub-sections on organizational effectiveness models, work group performance models, and entrepreneurial venture teams' literature that emphasizes interpersonal process in teams. This is followed by a section in which the four dimensions of team interpersonal process effectiveness (leadership, interpersonal flexibility, team commitment, and helpfulness) as identified by Watson et al. (1995) are discussed.

In the second section of the chapter, the issue of diversity is addressed. This section is also divided into sub-sections which discuss the impact of diversity on groups, demographic diversity, and relationship between demographic diversity and team effectiveness. In the last part of this section the demographic characteristics examined in this study (such as age, education, gender, and functional background) are discussed.

Based on an extensive discussion of literature in the previous two sections, in the third section the research model and specific hypotheses are presented. Finally, the last section is a summary of the chapter.
In spite of the vast literature on group dynamics, little research has addressed within-team processes in the business setting (Watson et al., 1995). There are several issues which are assumed to affect venture relations, but there is lack of a clear picture of the specific elements that constitute team effectiveness in practicing business teams. One of the reasons for the lack of this information is that to date, there has been little work examining what constitutes effectiveness in actual business teams. Relatively little research exists about the process of effectively assembling and maintaining venture teams in small businesses (Kamm, et al., 1990).

Effectiveness in groups has been variously addressed and evaluated (e.g., Gladstein, 1984; Hackman, 1983; Kolodny & Kiggundu, 1980; Nieva, Fleishman, & Rieck, 1978). Most of the work done to arrive at these evaluations has concentrated on group dynamics studied in larger organizations employing multiple teams. And although, like small business teams, product teams and executive teams need to concentrate on communication and integration between and within teams (Ancona & Caldwell, 1992; Ancona & Nadler, 1989; Hitt, 1993), the needs of the small business venture teams present a different context (Watson et al., 1995). Despite their critical interdependencies with suppliers and customers, small businesses do not fall under the scope of the larger business. For instance, when examining the structure and dynamic processes of entrepreneurial relationships, important interpersonal issues such as problem solving, bonding, conflict, and support, arise (Bird, 1989). Consequently, the intensity of
interpersonal processes could be greater in a small business team than in a larger corporate setting (Watson et al., 1995). Therefore, in order to better understand effectiveness in venture teams, it would be more helpful to examine literature that focuses on interpersonal relations in evaluating outcomes in organizations, than to exclusively focus on group effectiveness models which have been derived based on the study of large organizations. Studies have not addressed the unique needs of smaller businesses.

The following section addresses research relating to organizational effectiveness, group performance or group effectiveness (sometimes used interchangeably in the literature), and performance of successful entrepreneurial venture teams. All three areas acknowledge the importance of interpersonal relations in determining effectiveness in firms.

**Organizational Effectiveness**

Conceptually and empirically, organizational effectiveness has been a puzzle (Cameron, 1984). On the one hand, it is probably one of the most important constructs in the study of organizations (Cameron, 1984; Hitt, 1988), and on the other hand, there are no generally accepted conceptualizations or measurement criteria (Cameron, 1984; Campbell, 1977; Cunningham, 1977, 1978; Etzioni, 1960; Georgopoulos & Tannenbaum, 1957; Hitt, 1988; Mahoney, 1967; Mahoney & Weitzel, 1969; Molnar & Rogers, 1976; Quinn & Rohrbaugh, 1981, 1983; Seashore & Yuchtman, 1967). As Quinn and Rohrbaugh succinctly expressed:
"Despite the attention given to effectiveness, a widely shared definition of effectiveness has proved to be elusive...such a theory has not yet been generated, and the set of constructs that would make up the theory not yet articulated. Nor has a commonly accepted definition of effectiveness emerged." (1981: p. 123).

The literature abounds with criteria spanning from productivity and efficiency considerations to behavioral factors including job satisfaction, morale, and flexibility (Cunningham, 1977; Mahoney, 1967; Price, 1972). Often, the criteria chosen are a reflection of the researcher's interest or specialty (Webb, 1974), or are driven by convenience of operational measures (Goodman, Ravlin, & Schminke, 1987). Most researchers seem to think of effectiveness as a multidimensional concept.

With regard to studying effectiveness in team organizations, researchers have criticized the literature on work group and effectiveness by suggesting that the research produced so far is inconclusive, noncumulative, and inconsistent (Schwartzman, 1986). Factors that are identified as significant in one study are found to be "less important, not important at all, or even inversely important in another study" (Abbey & Dickson, 1983: p. 362). In order to better understand team effectiveness, it would be helpful to examine organizational effectiveness models, because team effectiveness influences the overall effectiveness of the organization (Goodman, Ravlin, & Schminke, 1987; Hitt, 1988; Tannenbaum, Beard, & Salas, 1992).

From the late 1950s to the early 1980s, a number of studies have discussed organizational effectiveness (e.g., Cameron, 1981; Connolly, Conlon, & Deutsch, 1980; Steers, 1975, 1976). Cunningham, (1977) examined seven different models for assessing organizational effectiveness in different situations, namely, rational goal model, systems
resource model, managerial process model, organizational development/internal process model, bargaining model, structural functional model, and functional model. Each of these models has been identified as having advantages in the evaluation of specific organizational problems and situations. Cameron (1984) suggests that it is crucial to identify the most appropriate model when trying to analyze effectiveness, because one approach may be more appropriate than another for a given situation. For the purpose of studying small business venture teams, the organizational development model/internal process model and the structural functional model appear to be most relevant.

The Organizational Development (OD) Model/Internal Process (IP) Approach. The OD model acknowledges effectiveness in terms of the organization's capability to solve problems and to renew (Cunningham, 1977; Likert, 1958, 1973; McGregor, 1960). It focuses on fostering team spirit, group loyalty, teamwork, confidence, trust and communication, and encourages freedom to set objectives (Cunningham, 1977; Likert, 1958). The emphasis is on developing interpersonal contact by enhancing skills in communication, leadership, problem-solving, and openness. Using knowledge and skills of the members available, the model attempts to integrate organizational goals with individual needs by appraising the organization's ability to work as a team (Cunningham, 1977).

The IP model emerged mainly from the human resource development (HRD) and OD models. The main characteristics include interaction of individuals within the organization in a participative manner, humanitarianism, and an absence of strain (Cameron, 1984).
According to Likert (1958, 1973), when organizations are assessed, several human factors should be taken into account. He encouraged openness and smooth interpersonal relations in order to improve effectiveness. Nevertheless, the most important factors include loyalty, motivation, the capability of the organization to communicate fully, and to interact effectively. Likert proposed that a firm will reach full potential only when all members of the work group have high interaction skills and performance goals. In order to evaluate the effectiveness of a firm, both causal and intervening human organizational factors should be taken into consideration. The causal variables include (1) organizational climate, such as communication flow, and concern for people, and (2) managerial leadership, including team building, support, goal emphasis, and helping others with the work. The intervening variables include (1) peer leadership, such as support, goal emphasis, helping others with work, and emphasis on team effort, (2) group process, such as coordinating efforts, effective problem solving, and sharing information, and (3) satisfaction. A change in the causal variables leads to a change in the intermediate variables, thereby producing a change in the end-result data or the dependent variables (Likert, 1958, 1973). This school of thought emphasizes open communication, supportiveness, and a lack of interpersonal conflict (Argyris, 1966; Kiesler, 1978; O'Reilly & Pondy, 1979).

The Structural Functional Model. This approach indirectly explains effectiveness in firms using team structures. The model attempts to understand structural patterns developed by the organization to maintain itself and grow (Cunningham, 1977; Selznick, 1948, 1953). According to this approach, an organization's effectiveness is enhanced by
its ability to develop certain structures, such as alliances, commitments, and mechanisms of participation (Cunningham, 1977). Among other things, the organization responds to these needs by emphasizing stability of informal relations inside the organization, which helps develop effective mechanisms for people to adjust to each other.

In summary, analysis of these approaches/models reveals that effectiveness of teams may be understood in light of organizational effectiveness models that emphasize the interpersonal or the human interaction aspect. Both approaches discussed above contribute elements to the evaluation of team effectiveness by emphasizing the significance of interpersonal relations and open lines of communication. In Table 1 a summary is displayed of the two approaches relative to their organizational situation, central focus, and assumptions.

**TABLE 1. Summary of Organizational Effectiveness Approaches**

<table>
<thead>
<tr>
<th>Organizational Effectiveness Model</th>
<th>Organizational Situation</th>
<th>Central Focus or Purpose</th>
<th>Assumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Development/ Internal Process</td>
<td>Evaluation of performance of organization’s human resources</td>
<td>Determine organization’s ability to work as a team and fit the needs of its individual members</td>
<td>Work organized to meet people’s needs as well as organizational requirements tends to produce highest productivity</td>
</tr>
<tr>
<td>Structural Functional</td>
<td>Evaluation of impact of organization’s structure on performance</td>
<td>Determining organization’s ability to develop structures to maintain and strengthen performance</td>
<td>System’s survival is equated to: 1. stability of lines of authority and communication 2. stability of informal relations in organizations</td>
</tr>
</tbody>
</table>

Source: Cunningham (1977)

Table 2 contains an overview of literature relevant to organizational effectiveness emphasizing interpersonal process in a team.
TABLE 2. Overview of Literature on Organizational Effectiveness Emphasizing Interpersonal Process in a Team

<table>
<thead>
<tr>
<th>Model</th>
<th>Author</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD/IP Model</td>
<td>Cameron</td>
<td>1984</td>
</tr>
<tr>
<td></td>
<td>Cunningham</td>
<td>1977</td>
</tr>
<tr>
<td></td>
<td>Likert</td>
<td>1958, 1973</td>
</tr>
<tr>
<td></td>
<td>McGregor</td>
<td>1960</td>
</tr>
<tr>
<td>Structural Functional Model</td>
<td>Cunningham</td>
<td>1977</td>
</tr>
<tr>
<td></td>
<td>Selznick</td>
<td>1948, 1953</td>
</tr>
</tbody>
</table>

The importance of interpersonal relations among team members has also been substantiated in the literature that deals with work group performance (e.g., Team Performance Model by Nieva, Fleishman, & Rieck, 1978; Model of Task Group Effectiveness by Gladstein, 1984; Sociotechnical Systems Model by Kolodny & Kiggundu, 1980; Normative Model by Hackman, 1983; and others), and entrepreneurial venture teams (e.g., Bird, 1989; Kamm et al., 1990; Timmons, 1979, 1990). A discussion of this literature relevant to the present study follows.

**Work Group Performance**

Interpersonal relations have also received attention in the literature that addresses work group performance. For instance, Hackman (1983), in his normative model, discusses intermediate effectiveness as pertaining to the quality of the group interaction process as it performs the task at hand. Indicators of the effectiveness of group interaction process in Hackman's model include assessments of the level of member effort, the extent to which resources are effectively applied, and the appropriateness of strategies
used to accomplish tasks. Gladstein (1984) suggests that theories of group effectiveness should be revised to include the way in which teams manage interactions. Argyris (1969) argued that to develop knowledge which would be useful in creating effective work teams, it may be necessary to create and test novel patterns of group interaction, and understand the ways members work together to reduce process losses and further synergistic process gains.

Guzzo (1987) reported data that effective groups, in terms of task accomplishment, are perceived to have more favorable interaction among members, and groups with poorer task accomplishment are seen as having poorer interaction process. Similar data was reported by Staw (1975). These findings indicate that there is a belief that task accomplishment and quality of interaction are related (Gladstein, 1984; Guzzo, 1987; Staw, 1975). Beer (1980) suggested that if groups are effective in their interpersonal relations, goal setting, communication, problem solving, and decision making, then the overall organizational effectiveness would also increase.

The importance of the group interaction process has also received attention in descriptive research on group behavior. McGrath (1964) proposed the input-process-output framework for analyzing and understanding group behavior and performance. The framework posits that there are various input factors (such as features of the group, its work context, and its task) that affect the interaction taking place within a group (i.e., the interpersonal transactions that take place within a group), which in turn has a bearing on the output of the group (such as performance, and other outcomes). The performance of the group can be assessed at any two points in time.
In the traditional model of group performance, outcomes are affected by the input variables through the intermediating effects of how members interact with each other (see part A of Figure 1). Hackman (1987) proposes some alternative ways of thinking about the role of the interaction process (part B and C of Figure 1).

FIGURE 1. Three ways of construing input-process-output relations in work teams (Source: Hackman, 1987, p. 321)

(A) Input conditions affect performance outcomes only through group interaction process (traditional model).

(B) Input conditions affect both group process and group performance.

(C) Input conditions affect both process and performance; there is also a reciprocal influence between process and performance.

Part B of the figure suggests that both process and performance are consequences of the way a group is set up (i.e., both process and performance would be determined by the input variables). The interaction in the group is an independent outcome for the group—
independent of the group's performance. Part C of the figure, on the other hand, suggests that the input variables impact both group process and performance, but that these variables also have a reciprocal effect on each other. This alternative suggests that the performance outcomes will influence group interaction, and vice versa (depending upon whether groups are studied over a long or short period of time). It can be seen, however, that regardless of the position/location of the interaction process in the group performance models, the group interaction process serves multiple purposes.

There are some other approaches that have been offered in an attempt to define effective teams. Some of these include the work of Likert (1961), and Parker (1991). An overview of research on work group performance emphasizing interpersonal process in a team is presented in Table 3:

TABLE 3. Overview of Literature on Work Group Performance Emphasizing Interpersonal Process in a Team

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td>Guzzo</td>
<td>1987</td>
</tr>
<tr>
<td>Gladstein</td>
<td>1984</td>
</tr>
<tr>
<td>Hackman</td>
<td>1983</td>
</tr>
<tr>
<td>Staw</td>
<td>1975</td>
</tr>
<tr>
<td>McGrath</td>
<td>1964</td>
</tr>
<tr>
<td>Likert</td>
<td>1961</td>
</tr>
</tbody>
</table>

Likert listed twenty-four characteristics of an effective team with a focus on the internal dynamics of the team. Some of those characteristics are listed below:

1. Members of an effective team are skilled in all the various leadership and membership roles and functions.
2. The group has been existent for a long enough period of time to have developed a well established working relationship.

3. The members have a high level of confidence and trust in each other.

4. Activities, such as interaction, decision making, and problem solving, occur in a supportive atmosphere.

5. The members help each other to develop full potential.

6. The group is capable of setting high performance goals.

7. Goals are clearly understood by all members.

8. Mutual help is offered to members as and when needed to accomplish goals.

9. There is high motivation in the group to communicate with each other.

10. The ability of the group members to influence each other contributes to the overall flexibility of the group.

According to Parker (1991), some of the characteristics of an effective team include the following:

1. Clear goals/purpose which have been accepted by members.

2. Everyone is encouraged to participate in the events and discussions of the team.

3. There is free and open communication between the members.

4. The team has a broad spectrum of member types (style diversity).

It is clear from the literature cited above that interpersonal interaction is a significant factor in determining outcomes for a team. In the words of Hackman (1987):

"group interaction provides the stage on which many dramas are played out, from political intrigues to romantic encounters.... It serves as an indicator of how, and how well a group is proceeding with work on its task--a window through which one can view the group as it does work" (p. 321).
Rarely, however, has the role of group process been assessed empirically, and whenever associations have been tested, they have been relatively weak (statistically), or have depended on the situational context (Hackman, 1987).

**Entrepreneurial Venture Teams**

Similar to the importance awarded interpersonal relations in the group performance literature, research on entrepreneurial venture teams also emphasizes the significance of interpersonal relations. As mentioned earlier, Timmons (1990) argues that not only is the existence of a team important, but so, too, is the quality of the team. It is, therefore, necessary that the interaction between team members and the working relationship be such as would enhance the overall effectiveness of the team. Timmons (1979, 1990) mentions that "substantial disaffection" often becomes a problem for the team members within five years of starting a venture ("Inside the Inc.," 1983; Kamm & Nurick, 1993; Welles, 1989). A survey done on venture capitalists reported that majority of the reasons for venture problems were those that related to flaws in the venture team (MacMillan, Zemann, & Subbanarasimha, 1987). A number of problems stem from interpersonal relationships among team members (Bird, 1989; Kamm et al., 1990; Thurston, 1986).

Other studies recognize that communication and cooperation among team members also affects effectiveness (Deutsch, 1949; Gladstein, 1984; Leavitt, 1951; Pearce & Ravlin, 1987). Venture teams, according to Timmons (1990), often arise because of
existing relationships; however, problems may occur from a lack of communication of expectations regarding work relationships (Bird, 1989; Kamm & Nurick, 1993; Lloyd, 1986, 1991; Neiswander, Bird, & Young, 1987), and motives for starting and developing a new venture (Greenberg & Weinstein, 1992; Morris, 1989; Norman & Zawacki, 1991). The failure to communicate goals and objectives among team members can be a source of problem during start-up as well as growth phases of a business (Timmons, 1979, 1990). In order to increase the chances of team effectiveness, team members should share their assumptions about the venture team structure and give importance to interpersonal skills (Bird, 1989; Rooney, 1987; Shapero, 1975; Wilemon & Freese, 1972).

Hitt (1993) suggests that shared values are very important for the effectiveness of venture projects, and Gersick (1994) mentions that an optimal sharing of knowledge and skills about business operations is essential for the effectiveness of venture teams. In sum, partners must be on the same "wavelength" about business operations and decisions (Watson et al., 1995). An overview of literature on entrepreneurial venture teams that emphasizes interpersonal processes is presented in Table 4 below:

### TABLE 4. Overview of Literature on Entrepreneurial Venture Teams Emphasizing Interpersonal Process in a Venture Team

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watson, Ponthieu &amp; Critelli</td>
<td>1995</td>
</tr>
<tr>
<td>Lloyd</td>
<td>1991</td>
</tr>
<tr>
<td>Kamm, Shuman, Seeger &amp; Nurick</td>
<td>1990</td>
</tr>
<tr>
<td>Timmons</td>
<td>1990</td>
</tr>
<tr>
<td>Bird</td>
<td>1989</td>
</tr>
<tr>
<td>MacMillan, Zeeman, &amp; Subbanarasimha</td>
<td>1987</td>
</tr>
<tr>
<td>Neiswander, Bird, &amp; Young</td>
<td>1987</td>
</tr>
</tbody>
</table>
Interpersonal Processes: The Ability to Operate as a Unit (Watson et al., 1995).

Many business ventures are started by entrepreneurial teams, and the interpersonal processes of these teams appear to affect the venture's performance. The role of such interaction process is complex, and sometimes, unclear (Hackman & Morris, 1975). And since team effectiveness involves the proficiency with which venture members operate as a unit (Watson et al., 1995), it is important to examine how partners interact with each other. As a result, there has been a call for a rekindling of research aimed at developing a better understanding of the interaction process that determines group outcomes (Hackman, 1976; McGrath & Kravitz, 1982).

As Tannenbaum, Beard and Salas (1992) suggest, the interpersonal approach to studying teams can enhance team effectiveness in two ways. First, team characteristics can be changed to improve levels of trust, cooperation, and cohesiveness. Second, it can help improve the team processes in a group (for example, communication and conflict resolution processes may be improved), thereby improving the quality of inter-member relations, and thus indirectly also enhancing task effectiveness (Hackman, 1978).

There are several factors that may constitute effectiveness from an interpersonal process perspective. Watson et al. (1995) identify four such dimensions which include: leadership, interpersonal flexibility, team commitment, and helpfulness. Leadership, for instance, would include characteristics like setting high quality goals effectively, efficient problem solving, continually improving, and contributing significantly to team. The interpersonal flexibility factor includes characteristics like openly sharing information with
team members, being flexible, and resolving conflict. Similarly, team commitment includes enthusiasm for group performance, group orientation, and coordinating group effort.

Lastly, helpfulness includes characteristics like being friendly, cooperative, and helpful. These factors are discussed in the following sections.

**Leadership.** Leadership, in a team, is any action which helps the team to reach its goals (Parker, 1991). Members should take the initiative to take active roles, and provide leadership functions in a team. Examined another way, "leadership functions are those activities that contribute to the establishment and maintenance of favorable performance conditions" (Hackman & Walton, 1986: p. 89).

Leadership of a team must be shared among team members (Parker, 1991). All members must take responsibility for meeting the needs of the team. Based on McGrath's (1964) framework, this involves two behaviors: monitoring--i.e., obtaining and interpreting data about performance conditions--and, taking action to create and maintain favorable conditions. Activities to fulfill these requirements may include setting goals effectively, setting high quality standards, contributing to the team processes, and continuously improving performance (Watson et al., 1995). Other leadership responsibilities may include initiating, offering facts, seeking information, clarifying, coordinating, and testing reality (Parker, 1991). Leadership, according to Parker (1991), is one of the most important concepts of team effectiveness, and one that is the most difficult to teach.

Related to the importance of effective leadership, is the importance of setting goals. Setting effective goals is a well-documented factor that affects the way a group
produces outcomes. Well-defined goals are presumed to be critical to group effectiveness not only according to the conceptual literature (Davis & Wacker, 1987; Gladstein, 1984; Hackman, 1987; Shea & Guzzo, 1987; Sundstrom, DeMeuse, & Futrell, 1990), but also empirical literature (Buller & Bell, 1986; Pearson, 1987; Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988; Woodman & Sherwood, 1980). A team must know why it exists, and what and how it should accomplish its goals. The attempt should always be to set high quality standards (Crosby, 1980; Juran, 1980; Parker, 1991). In the words of Hackman & Walton (1986), "Having a clear sense of what is expected, and why it is important, appears to be a prerequisite condition for team effectiveness" (p. 83). Furthermore, identifying the appropriate level of goal difficulty (Kukla, 1975; Weingart, 1992; Zander & Newcomb, 1967), and obtaining goal acceptance (Mitchell & Silver, 1990) are also important ingredients for effectiveness. Effective teams are aware of their progress towards goal achievement (Gaddy & Wachtel, 1992), and frequently stop to examine their progress (Goodman & Dean, 1982; McGregor, 1960; Weingart, 1992). Furthermore, it is not only important to have high quality standards and well defined goals, but also to have goal interdependence among group members (Campion et al., 1993).

Once the goals have been effectively identified and set, the next step is to ensure that they are regularly revisited and performance is continually improved. In fact, one of the hallmarks of teams, as well as a consequence, is continuous improvement (Hall, 1987; Hoerr, 1989). All team members should understand that performance and quality improvement is a continuous job, and not just a short-term program (Crosby, 1980; Feigenbaum, 1982; Hall, 1987; Juran, 1980).
Besides setting effective goals, and striving for continuous improvement, it is also essential for the team members to participate in the team processes and contribute in a significant manner (Parker, 1991). Participation and contribution are presumed to enhance group effectiveness by improving members' sense of ownership and responsibility towards the work (Campion et al., 1993). Another way to look at the importance of participation and actively contributing in a team is that it enhances effectiveness by reducing social-loafing or free-riding (Albanese & Van Fleet, 1985; Harkins, 1987; Latane, Williams, & Harkins, 1979). It may also enhance decision quality via increased communication and interaction among team members (Campion et al., 1993).

Interpersonal Flexibility. Another characteristic of effective groups or teams is the flexibility that is demonstrated by team members (Campion et al., 1993) toward each other. Parker mentions that members of effective teams never say, "That's not my job" (p. 49). An effective team is one where the team members demonstrate flexibility with each other, and offer to pitch in when other members need help. Communication, cooperation, and sharing information in a group are also important to the effectiveness of a team (Campion et al., 1993). They have been shown to have an effect on effectiveness in laboratory studies (Deutsch, 1949; Leavitt, 1951), and are addressed in group performance models (e.g., Gladstein, 1984; Pearce & Ravlin, 1987). Additionally, sharing information can increase cooperation (Orbell, van de Kragt, & Dawes, 1988), and may also help to resolve conflict.

Several authors and researchers have identified effectively resolving conflicts as an important interpersonal skill for team members (Alderfer, 1977, Gladstein, 1984;
Goodman, Ravlin, & Argote, 1986; Levine & Moreland, 1990; McGrath & Kravitz, 1982; Saavedra, Earley, & Van Dyne, 1993; Sundstrom et al., 1990). Conflicts usually arise when group members believe that their goals cannot be achieved simultaneously (Levine & Moreland, 1990; Pruitt & Rubin, 1986).

Not all conflicts or disagreements, however, have negative consequences. In fact, some conflict may actually be constructive (Bennis & Shepard, 1956; Deutsch, 1973; Gersick & Davis-Sacks, 1990). The key, however, to resolving conflict in an effective team is that it should occur in a supportive atmosphere (Likert, 1961). Suggestions, ideas, information, and criticisms should be offered and received with a helpful orientation. Effective teams create a climate in which members feel free to express their differences of opinion (Parker, 1991). The attempt in an effective team is to use communication and problem-solving skills, and jointly find solutions that would satisfy all the parties involved (Pruitt, 1971; Pruitt & Lewis, 1975; Thompson & Hastie, 1990), while considering the contributions of other members (McGrath, 1984; Porter, Lawler, & Hackman, 1987). Each individual member's style should contribute to, and encourage flexibility, open sharing of information and solving conflicts effectively.

**Team Commitment.** Yet another important interpersonal aspect of effective teams is team commitment and preference for group work (Campion et al., 1993; Watson et al., 1993). An effective team has members who have value for team goals and performance, and who help coordinate efforts in order to accomplish those objectives. Hackman (1987) posits that members with team spirit are more committed and willing to work hard for the common goals of the group. Some authors note that preferences (for group work) may
influence team members' reactions to their jobs (Fried & Ferris, 1987; Hackman & Oldham, 1975), even though the impact may not be large (Campion, 1988). Team members who prefer to work in groups may be more satisfied and effective in group settings (Cummings, 1981; Hackman & Oldham, 1980). The members of an effective group are highly motivated to abide by the common goals, and are enthusiastic about achieving those goals. Each member does all that he or she can to help the group achieve its major objectives (Likert, 1961; Parker, 1991).

**Helpfulness.** Related to the characteristic of team commitment and focus on common goals, is the characteristic of helpfulness. Effectiveness may be improved when team members help each other out, provide social support, and have positive interactions (Campion et al., 1993). Parker (1991) includes informal climate as a supporting characteristic for effective teams. According to him, the atmosphere should be friendly and cooperative, so that members feel comfortable interacting with other members who may be of different position, race, sex, or age. Gladstein (1984) describes such supportiveness as a group maintenance behavior, which is arousing, and which may enhance effectiveness by sustaining effort on tasks (Campion et al., 1993).

In Table 5, a summary and overview of the literature on the four dimensions of team interpersonal process effectiveness, as identified by Watson et al., (1995) is presented.
TABLE 5. An Overview of Literature on the Four Dimensions of Team Interpersonal Process Effectiveness

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Author(s)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates effective leadership functions</td>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td></td>
<td>Hackman &amp; Walton</td>
<td>1986</td>
</tr>
<tr>
<td></td>
<td>McGrath</td>
<td>1962</td>
</tr>
<tr>
<td>Set high quality standards</td>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td></td>
<td>Juran</td>
<td>1986</td>
</tr>
<tr>
<td></td>
<td>Crosby</td>
<td>1980</td>
</tr>
<tr>
<td>Continuous improvement</td>
<td>Gaddy &amp; Wachtel</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Goodman &amp; Dean</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Weingart</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Juran</td>
<td>1986</td>
</tr>
<tr>
<td></td>
<td>Crosby</td>
<td>1980</td>
</tr>
<tr>
<td></td>
<td>McGregor</td>
<td>1960</td>
</tr>
<tr>
<td>Contributes significantly to team</td>
<td>Campion, Medsker, &amp; Higgs</td>
<td>1993</td>
</tr>
<tr>
<td></td>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td></td>
<td>Harkins</td>
<td>1987</td>
</tr>
<tr>
<td></td>
<td>Albanese &amp; Van Fleet</td>
<td>1985</td>
</tr>
<tr>
<td></td>
<td>Latane, Williams, &amp; Harkins</td>
<td>1979</td>
</tr>
<tr>
<td>Set goals effectively</td>
<td>Weingart</td>
<td>1992</td>
</tr>
<tr>
<td></td>
<td>Hackman &amp; Walton</td>
<td>1986</td>
</tr>
<tr>
<td></td>
<td>Kukla</td>
<td>1975</td>
</tr>
<tr>
<td></td>
<td>Zander &amp; Newcomb</td>
<td>1967</td>
</tr>
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</table>

Table 5 (continued)
TABLE 5 (Continued)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Author(s)</th>
<th>Year</th>
</tr>
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<tbody>
<tr>
<td><strong>Interpersonal Flexibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates flexibility with members</td>
<td>Campion, Medsker, &amp; Higgs</td>
<td>1990</td>
</tr>
<tr>
<td></td>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td>Resolves conflict with members</td>
<td>Levine &amp; Moreland</td>
<td>1990</td>
</tr>
<tr>
<td></td>
<td>Sundstrom, De Meuse, &amp; Futrell</td>
<td>1990</td>
</tr>
<tr>
<td></td>
<td>Goodman, Ravlin, &amp; Argote</td>
<td>1986</td>
</tr>
<tr>
<td></td>
<td>Gladstein</td>
<td>1984</td>
</tr>
<tr>
<td></td>
<td>Alderfer</td>
<td>1977</td>
</tr>
<tr>
<td>Openly shares information about tasks</td>
<td>Campion, Medsker, &amp; Higgs</td>
<td>1993</td>
</tr>
<tr>
<td></td>
<td>Orbell, van de Kragt, &amp; Dawes</td>
<td>1988</td>
</tr>
<tr>
<td>Individual style aids team problem solving</td>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td></td>
<td>Thompson &amp; Hastie</td>
<td>1990</td>
</tr>
<tr>
<td></td>
<td>Porter, Lawler, &amp; Hackman</td>
<td>1987</td>
</tr>
<tr>
<td><strong>Team Commitment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helps coordinate effort among members</td>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td></td>
<td>Likert</td>
<td>1961</td>
</tr>
<tr>
<td>Enthusiasm for team performance</td>
<td>Hackman</td>
<td>1987</td>
</tr>
<tr>
<td></td>
<td>Cummings</td>
<td>1981</td>
</tr>
<tr>
<td></td>
<td>Hackman &amp; Oldham</td>
<td>1975</td>
</tr>
<tr>
<td>Focus on common team goals</td>
<td>Campion, Medsker, &amp; Higgs</td>
<td>1993</td>
</tr>
<tr>
<td></td>
<td>Hackman &amp; Oldham</td>
<td>1980</td>
</tr>
<tr>
<td><strong>Helpfulness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help members beyond what was required; and</td>
<td>Campion, Medsker, &amp; Higgs</td>
<td>1993</td>
</tr>
<tr>
<td>Friendly and cooperative with members</td>
<td>Parker</td>
<td>1991</td>
</tr>
<tr>
<td></td>
<td>Gladstein</td>
<td>1984</td>
</tr>
</tbody>
</table>
Given the significance of interpersonal relations in determining the effectiveness of a group, it would also be important to recognize the inputs to the process of interaction that create the synergistic effect—positive or negative (Hackman, 1987)—in teams. Various studies done on effectiveness that emphasize the importance of interaction process discuss the composition aspect of the group and its impact on interaction that takes place within a group (e.g., McGrath's input-process-output model, 1964; Hackman's normative model, and others). Because the members of a small group are its most important resource and the events that take place within a group reflect the members who belong to it, some researchers consider the composition of the group an important aspect (Levine & Moreland, 1990). While some authors consider composition as a contextual factor or a consequence, most researchers consider it as a causal factor, influencing various other aspects of a group's processes (see Levine & Moreland, 1990).

When examined as a causal factor, the effect of composition is studied in terms of size (Kerr, 1989; Latane, 1981; Markham, Dansereau & Alutto, 1982), demographics (Pfeffer, 1983; Wagner, Pfeffer, & O'Reilly, 1984), abilities of group members (Bantel & Jackson, 1989; Tziner & Eden, 1985), opinions of group members (Stasser, Kerr, & Davis, 1989), and personalities of group members (DeBiasio, 1986). When examined as a context, composition is considered a social context within which other psychological phenomenon unfold. Instead of causing them directly, composition of the group moderates these phenomena (Levine & Moreland, 1990). Only a few researchers regard the composition of a small group as a consequence or outcome (Levine & Moreland, 1990).
Irrespective of how it is addressed, and what it is called, composition of a group is a theme in all models of effectiveness (Campion et al., 1993). For instance, while Guzzo & Shea (1992) and Gladstein (1984) refer to it as group composition, Hackman calls it group design, and Tannenbaum et al. (1992) call it team characteristics.

Several aspects of group composition influence the effectiveness of a team (Campion et al., 1993). Researchers have studied demographic aspects (e.g., age, education, sex, functional experience, size, etc.), as well as the heterogeneity aspect of membership.

The composition directly affects the kind and amount of knowledge and skills available in a group and how the interpersonal processes are carried out (Hackman, 1978). In fact, how well a group performs is determined by how well that group is designed and staffed (Hackman, 1978). Hackman (1990) suggests asking the following questions regarding group composition:

"Is the group well staffed? Is it the right size, given the work to be done? Do members have the expertise required to perform the task well? Do they have sufficient interpersonal skill to function well in a team? Is the mix of members appropriate? Are there signs that members are so similar that there is little for them to learn from one another? Or are there signs that they are so heterogeneous that they risk having difficulty communicating and coordinating with one another?" (p. 11).

The literature suggests that in order for the groups to be effective, there should be enough heterogeneity (diversity of membership) so that members can benefit from each other (Hackman & Oldham, 1980; Hackman & Walton, 1986). Research suggests that the inclusion of individuals with different experiences, backgrounds, and approaches makes
for more creative and effective groups which are able to avoid groupthink (Bird, 1989). According to Bird (1989), the most effective entrepreneurial teams would be those that include complementary skills, as well as differences in style, experience, backgrounds, and so forth. Less effective teams would be composed of members with overlapping skills and few differences. Teach et al. (1986) also support the importance of heterogeneity and diversity in the composition of an entrepreneurial team. To better understand the importance and impact of diversity in teams, it would be helpful to examine literature that discusses the various aspects of diversity. Diversity, demographic diversity, and its impact on team interpersonal process effectiveness are discussed in the next section.

**Summary.** Although effectiveness has been variously defined in the literature with respect to organizational effectiveness, work group performance, and entrepreneurial venture teams, it is evident from examining the various models proposed, that there is value in studying effectiveness from an interpersonal interaction perspective. Groups and teams are made up of individuals, each having his or her own unique characteristics. Although these characteristics influence group interaction independently of the actions of others in the team, there are still important effects that are created by the relationships among the characteristics of the team members (Shaw, 1983). By studying these interpersonal effects that are produced, and by studying the effect of the various demographic characteristics of team members, it may be possible to enhance team effectiveness in two ways.

First, the characteristics of the team may be changed, which would alter the interaction patterns in the team. Second, the change (if positive) in the interpersonal
relations may help enhance effectiveness, as a result of improved communications, conflict resolution, goal setting, problem solving, and so forth. In sum, this approach is based on improving the interaction patterns that exist in a team by altering the characteristics of members available in a team, thereby enhancing the overall team effectiveness. It seems that fertile ground exists for studying effectiveness of venture teams as determined by interaction between team members.

Diversity

The profile of the American workforce has changed considerably since the 1960s (Cox, Lobel & McLeod, 1991; Kanter, 1986). These changes have not only been in the expectations that people have from their jobs (Kanter, 1986), but also in the demographic make-up of the population (age, gender, education, etc.). It is also predicted that the one major characteristic that will describe the workforce of the future will be diversity. Workforce 2000 is expected to be a blend of gender, race, age, education, ethnicity, skills, and abilities. In keeping with this prediction, some writers have asserted that diversity is an economic issue (Copeland, 1988, Cox & Blake, 1991), and if managed appropriately, can add value to organizations and enhance performance. Therefore, research that relates to understanding diversity would serve the important purpose of enhancing effectiveness and performance in firms.
Impact of Diversity on Groups

Diversity has positive and negative impacts in firms (Adler, 1991; Watson & Kumar, 1992). Steiner (1972) noted that, "diversity augments potential productivity while greatly increasing the complexity of the process that must occur in order for the group to realize its full potential" (p. 107). According to Adler (1991), some of the advantages of group diversity include increased creativity (wider range of perspectives, better ideas, less "groupthink"), better understanding of others' perspectives, better problem definition, and better decisions. On the other hand, she identified some disadvantages which include lack of cohesion (mistrust, miscommunication, stress), which may cause inability to gain consensus and take concerted action. Overall, however, the potential productivity of diverse groups is high (Watson & Kumar, 1992). Such teams have a wide array of resources, insights, perspectives, and experiences that encourage the generation of new and better ideas. The key, according to Adler (1991), therefore, is to capitalize on the diverse elements in order to maximize the potential benefits that may arise from such diversity.

The early diversity research focused on the homogeneous-heterogeneous aspect, which some researchers believe to be the most significant (Shaw, 1981). The assertion that heterogeneous groups are more effective than homogeneous groups is not new (Hurst, Rush & White, 1989). Hoffman (1959), studied the heterogeneity of member personality and its effect on group problem solving. He found that the nonhomogeneous
groups produced better and more inventive solutions than the homogeneous groups. In 1961, Hoffman and Maier used a wider variety of problems to test the results of Hoffman's (1959) earlier work. As a measure of solution quality, they used the mined road problem which required the groups to generate the safest method to cross a heavily mined road. Heterogeneous groups produced higher quality solutions than did homogeneous groups. Mixed-gender groups also tended to produce higher quality solutions than the all-male groups.

Contrary to these findings, some research that was done with respect to cultural (racial) diversity in the 1970s found that racially mixed groups were less efficient than racially homogeneous groups. For instance, Fenelon and Megargee (1971) divided black and white college women into groups and assigned tasks that required a group decision. On an average, it took 5.8 seconds for the homogeneous group and 9.8 seconds for the heterogeneous group to reach a decision.

Recent research findings that relate to diversity in groups have substantiated the findings of earlier research. For instance, the benefits of diversity in decision making solutions is confirmed by the findings of Wanous and Youtz (1986). Their results provided support for the notion that diversity in groups enhances the quality of solutions generated and decisions reached. They found that the generation of diverse solutions stimulates effective group discussions and creates the need to reconcile or integrate diverse solutions, which ultimately leads to high quality decisions. A summary of literature of the impact of diversity on groups is presented in Table 6.
TABLE 6: Overview of Literature on Impact of Diversity on Groups

<table>
<thead>
<tr>
<th>Author(s)</th>
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<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bettenhausen</td>
<td>1992</td>
<td>-</td>
</tr>
<tr>
<td>Watson &amp; Kumar</td>
<td>1992</td>
<td>+</td>
</tr>
<tr>
<td>Wanous &amp; Youtz</td>
<td>1986</td>
<td>+</td>
</tr>
<tr>
<td>Steiner</td>
<td>1972</td>
<td>+</td>
</tr>
<tr>
<td><strong>Heterogeneity in Groups</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shaw</td>
<td>1981</td>
<td>+</td>
</tr>
<tr>
<td>Ruhe &amp; Allen</td>
<td>1977</td>
<td>-</td>
</tr>
<tr>
<td>Fenelon &amp; Megargee</td>
<td>1971</td>
<td>-</td>
</tr>
<tr>
<td>Triandis, Hall, &amp; Ewen</td>
<td>1965</td>
<td>+</td>
</tr>
<tr>
<td>Hoffman &amp; Maier</td>
<td>1961</td>
<td>+</td>
</tr>
<tr>
<td>Hoffman</td>
<td>1959</td>
<td>+</td>
</tr>
</tbody>
</table>

+ = Diversity has positive impact on groups  
- = Diversity has negative impact on groups

Relating to another aspect of diversity, Watson, Kumar and Michaelson (1993) studied the impact of cultural diversity on problem solving and group processes in groups of Anglo-American, African-American, Hispanic-American, foreign national students and all-Anglo students. They reported that, over the four months that these groups were studied, in the first month, the homogeneous groups were more efficient than the heterogeneous groups. However, in the fourth month they found that, although homogeneous groups came up with the highest quality solutions, the culturally diverse groups generated more and wider range of perspectives. They found the overall performance of these groups to be equal in the fourth month.

An examination of the studies that relate to various aspects of diversity reveals that although heterogeneity in groups presents some hurdles (Bettenhausen, 1991; Fenelon & Megargee, 1971; Ruhe & Allen, 1977), research has also shown that heterogeneity in
groups is a source of innovation and creativity, and hence, leads to the generation of a wider range of solutions (Hoffman, 1959; Hoffman & Maier, 1961; Shaw, 1981; Triandis, Hall & Ewen, 1965; Watson, et al., 1993). The key lies in exploring how diverse perspectives and opinions can be integrated for better outcomes (Bettenhausen, 1991).

**Demographic Diversity**

Stinchcombe, McDill and Walker (1968) stated that firms, like communities, are made up of people. These people bring with them some perceptions, experiences, and interpretations based on the characteristics they possess, which are reflective of their cognitive base (Bantel, 1993; Hambrick & Mason, 1984; March & Simon, 1958; Wiersema & Bantel, 1992). Shaw (1981) suggested that people who comprise groups determine the groups' processes based upon the unique characteristics and cognitive abilities they contribute to the group. The decisions and strategic choices made in firms and organizations are based upon the combination of perceptions and values of the decision makers (Hambrick & Mason, 1984). Hambrick and Mason (1984), in their study on organizations as a reflection of its top managers' characteristics, pointed out that strategic choices and organizational performance are derived partially from the cognitive bases and background characteristics of the top managers. The cognitive base and the values provide a screen through which situations are assessed.

Combinations of people put together in a group determine the manner in which that group functions (Rosenberg, Erlick & Berkowitz, 1955; Shaw, 1981). The term
"assembly effect" has been used to describe variations in group processes that arise from the particular combinations of people in a group, besides the effect that arises from the specific characteristics of group members.

For instance, the effects of group composition were studied by Shaw, Ackerman, McCown, Worsham, Haugh, Gebhardt and Small (1979) in peer learning groups. Eight problems were assigned to four-person groups of students, where each student participated in eight different groups. The researchers found that the performance of students was different in each group, and depended upon which other students were part of that group. Therefore, it seems that persons who comprise groups determine group behavior and action. As March and Simon (1958) argued, there are certain "givens" that each member brings to a situation. These "givens" indicate the decision-maker's cognitive base as reflected by assumptions and knowledge about the future, knowledge of alternatives, and consequences that may arise from the alternatives (Hambrick & Mason, 1984).

According to Wiersema and Bantel (1992), the study of demographics builds on the research that connects demographic characteristics with values, beliefs, and abilities. Because a person's cognitive base evolves from his prior experiences (Cyert & March, 1963), the demographic characteristics are reflections of that cognitive base (Dearborn & Simon, 1958; Hambrick & Mason, 1984; Kahalas & Groves, 1979; Walsh, 1988).

In addition, demographic theory has been of interest in organizational research because of the theoretical importance it offers to the study of organizations (Stinchcombe, McDill, & Walker, 1968). Several researchers have called for greater and continued use
of this approach in organizational research, citing objectivity, predictive power, and parsimony as some of its benefits (Hambrick & Mason, 1984; Katz, 1982; Michel & Hambrick, 1992; Pfaff, 1981, 1983; Wagner, Pfaff, & O'Reilly, 1984). Pfaff wrote: "Demography is an important, causal variable that affects a number of intervening variables and processes and, through them, a number of organizational outcomes" (1983: 350). Furthermore, research suggests that both the demographic characteristics (called demographic traits effects) as well as the diversity or heterogeneity of perspectives and cognitive resources (called demographic diversity effects) are significant to the understanding of group performance (Hoffman, 1959; Hoffman & Maier, 1961; Triandis, Ewen, & Hall, 1965; Wiersema & Bantel, 1992; Zenger & Lawrence, 1989). With regard to demographic trait effects, Wiersema and Bantel (1992) state that the extent to which members have certain demographic characteristics, predicts their perspectives and interpretations. Demographic diversity effects, "which refer to the relative homogeneity or heterogeneity of a team on a characteristic, suggest the breadth of perspective available in a decision-making process" (Wiersema & Bantel, 1992: p. 95). In order to fully understand the importance of demographics, it is essential to examine both the trait effects, as well as diversity effects.

Demographics of Organizational Leaders. Organizational theorists have frequently discussed the importance of the role that organizational leaders play in determining the performance of a firm. To date, research that examines the relationship between leaders' personal characteristics and organizational outcomes has taken two different streams (Bantel & Jackson, 1989). One approach considers the psychological
attributes of those involved in decision making and how that relates to outcomes (e.g., Gartner, 1989; Hage & Dewar, 1973; Miller, Kets de Vries, & Toulouse, 1982). The other approach is to use demographic characteristics (such as age, education, gender, etc.), based on the assumption that such characteristics relate to attitudes, cognitive abilities, and decision-making expertise (Bantel & Jackson, 1989; Gartner, 1989).

The second approach suggests that each team member, because of his/her different characteristics, would respond to, and understand situations differently. As a result, the demographic composition of the decision-making team can influence the decisions made in a venture and how those decisions are reached. It is, therefore, crucial to examine a firm's "dominant coalition" of individuals responsible for setting the direction of a firm (Cyert & March, 1963). Mintzberg (1979) states that it is this coalition, or group of individuals, who is responsible for identifying opportunities and threats, and formulating and implementing strategic changes in the firm. Hambrick and Mason (1984) also advocate their "upper echelon perspective" to examine the relationship between the characteristics of top management and organizational outcomes.

**Relationship Between Demographic Characteristics and Team Effectiveness**

Groups are composed of individuals, each of whom has his or her own unique characteristics and way of behaving. These characteristics influence how the group behaves and performs. In fact, according to Shaw (1981), individual characteristics affect group processes in two ways. First, it influences how the members will behave
themselves, and how others will react to them. The second impact on the group behavior derives from the particular combination of individual characteristics (of the members) that is available to a group. Some group theorists are of the belief that good interpersonal relations and interactions with each other may be more important for effective groups than abilities and skills possessed by the group members (Shaw, 1981). The effectiveness of the group may be increased by changing the combination of characteristics available to the group, or by attending to the interpersonal needs of the group members (Shaw, 1981).

The effect of demographic diversity on team effectiveness is difficult to predict from the existing research available. For instance, even though research indicates that heterogeneous teams sometimes experience more problems than homogeneous teams (Feldman, Sam, McDonald, & Bechtel, 1980; Nemeth, 1986; Pfeffer, 1983), they have also been more effective in solving complex, non-routine problems (Shaw, 1976, 1983). On the other hand, Bettenhausen, in his review of 250 studies on small groups, pointed out that

"most studies have found that diversity hinders group and organizational performance, especially in times of crisis and rapid change. It seems that under current organizational practices, the advantages provided by multiple perspectives are offset by problems of generating consensus. ... concerted effort is needed to explore how diverse perspectives can be shared more effectively" (1991: p. 356).

Hackman and Walton (1986) suggest that as far as group composition issue in a team goes, there should be as few members as possible given the work that needs to be done, and they should be balanced on homogeneity/heterogeneity. This means that team members should neither be functional replicas of each other, nor be so different that they
cannot learn from one another. Similarly, Gladstein (1984) states that one of the aspects of group composition that affects effectiveness includes group heterogeneity which assures positive interaction.

Logically, diversity should be an asset that the teams could exploit to achieve more effectiveness and higher performance (Buller, 1986; Janis, 1982). The findings of the previous research suggest that very high levels of heterogeneity may negatively affect the effectiveness of teams. The lack of longitudinal studies and empirical work in the area, however, makes it difficult to predict how demographic diversity would overall impact team effectiveness, especially in small businesses. This is particularly the case since most of the group related research has been conducted in large organizations.

Next are stated some specific hypotheses about the expected relationship between demographic characteristics and team interpersonal process effectiveness. For each section, a detailed summary of empirical findings is presented.

**Average Age**

A fair amount of research exists that examines demographics and work attitudes in organizations. Most of this research, however, is based on large organizations. Little attention has been paid to these constructs in small businesses, particularly with respect to age (Smith & Hoy, 1992). The findings of such research may be just as significant to the small businesses as they are to the larger organizations since both are faced with an older work force (McLaughlin, 1989; Rosen, 1988, U.S. Small Business Administration, 1988).
Firms in the future will be dependent upon this aging population not merely because of their increasing numbers, but also because of the skills and expertise they offer. Whatever research exists, it presents inconclusive results (Cooper & Gascon, 1992).

Research on chronological age has long been established in sociology and anthropology (Eisenstadt, 1956; Elder, 1975; Riley, 1987). Age has been used to classify individuals into behaviors and roles (Bantel, 1993). Increasingly, age as a factor, is being studied in organizational research (e.g., Avolio & Waldman, 1990; Avolio, Waldman, & McDaniel, 1990; Bantel, 1993; Bantel & Jackson, 1989; Hambrick & Mason, 1984; Wiersema & Bantel, 1992). Relatively fewer studies exist, however, that examine the impact of age in small firms (Cooper & Gascon, 1992).

Chronological age is an important determinant of how individuals behave in a group (Shaw, 1981). As early as 1932 researchers noticed that there was a difference in the amount of social contacts that people maintained at different age groups (e.g., Beaver, 1932; Bernhardt, Millichamp, Charles, & McFarland, 1937). The increasing complexity of behaviors with age has also been reported by some investigators (e.g., Dymond, Hughes, & Raabe, 1952). Although the relationship between the age of top management and organizational outcomes has not been studied very well (Hambrick & Mason, 1984), there are some studies that report consistent results. Wiersema and Bantel (1992) found a positive relationship between average age of top management and corporate strategic change. Bantel and Jackson (1989) found a negative correlation between the average age of top management and innovation.
Research has suggested that older employees are more resistant to change (Carlsson & Karlsson, 1970; Rosen and Jerdee, 1976), and show a preference for established routine (Chown, 1960; Daboub, Rasheed, Priem, & Gray, 1995). Wiersema and Bantel (1992) noted that flexibility decreases and rigidity increases as people age. Smith and Hoy (1992) reported that while this aging category of workers may have more experience, they may be less flexible and more resistant to the change especially necessary in small firms. In a related vein, Costanzo and Shaw (1966) hypothesized a curvilinear relationship between age and conformity. They concluded that conformity increased with age to a maximum till the age of 11 to 13, and decreased thereafter.

Not only does the receptiveness to change decrease with increasing age, but so does the cognitive ability, including grasping new ideas, reasoning, memory, and behavior (Avolio & Waldman, 1990; Botwinick, 1977; Burke & Light, 1981; Carlsson & Karlsson, 1970). Older executives place a great deal of importance on both financial and job security. Consequently, they may avoid risky decisions (Carlsson & Karlsson, 1970; Vroom & Pahl, 1971). Younger executives and entrepreneurs, on the other hand, have been known to take more risk (Hambrick & Mason, 1984; Ronstadt, 1984; Wiersema & Bantel, 1992). Grimm and Smith (1986) found an inverse association between innovation and managerial age. Two other studies (Child, 1974; Hart & Mellons, 1970) provided some evidence for an association between corporate growth and lower managerial age. In their classic study on the relationship between age and risk taking among managers, Vroom and Pahl (1971) found that both risk taking as well as the value placed upon risk decline with age. Older decision makers also tend to take longer to reach decisions, seek
greater amounts of information, and are less confident of their decisions (Child, 1974; Taylor, 1975). Furthermore, as people age, the ability to integrate declines (Taylor, 1975) as does the ability to evaluate options in the decision-making process (Hart & Mellons, 1970; Kirchner, 1958; Surwillo, 1964), to reach quality decisions (Birren, 1964; Weir, 1964).

In an extensive review of literature on age, Rhodes (1983) concluded that overall job satisfaction is positively related to age. She also reported the results of 17 bivariate analyses showing that older workers tend to be more committed to the organization than younger workers (e.g., Angle & Perry, 1981; Hrebiniaiak, 1974; Morris & Sherman, 1981, etc.). On the other hand, when results of multivariate studies were examined, five supported a positive relationship (e.g., Bluedorn, 1982, Michaels & Spector, 1982, Steers, 1977; etc.) and seven reported nonsignificant results (e.g., Lee, 1971; Stevens, Beyer, & Trice, 1978, etc.). In a study of small firms, Smith and Hoy (1992) studied the relationship between commitment and age, and found that age was positively related to organizational commitment.

When commitment in team organizations is examined, however, an important fact needs to be considered. Older workers grew up in systems which were more mechanistic (Burns & Stalker, 1961), which had much less expectation for group interaction and decision making than the younger workers (Gilbert, Collins, & Brenner, 1991). The same also applies to the leaders of such organizations. In the words of Gilbert, Collins, and Brenner (1991: p. 194), "Indeed, the very education of younger leaders has been less prescriptive and more self-directed, group-focused, and organic." This difference in work
culture can be expected to have an effect on the commitment an individual would have towards an organization. There is no evidence to indicate, however, that older or younger workers communicate more or less frequently with others (Zenger & Lawrence, 1989).

Gilbert et al., (1991) also presented some evidence that younger workers engage in more relationship-oriented activities than older workers (who may have less need for those relationships). In a study analyzing age and leadership effectiveness, Gilbert et al. (1991) reported that younger leaders were rated higher than older leaders in off-the-job relations ("friendship") and "enjoyableness". The younger leaders were rated higher in "partner behavior." However, they found no difference in "outreach behavior" (which they defined as getting along with others beyond the work group) and leader age.

With regard to leadership and age, Shaw (1981) indicates that leadership behavior with respect to age has been extensively studied using the trait approach. Stogdill (1948) reviewed trait studies of leadership and reported that although the findings were inconsistent, in a number of cases leaders were older than nonleaders. Similarly, Stewart and Gudykunst (1982) found a positive relationship between age and hierarchical level.

While it is helpful to examine literature that is based on larger organizations, it is also necessary to examine the smaller firms. Because effectiveness has sometimes been defined based on the context of the study (e.g., sometimes performance and effectiveness have been used synonymously), it is necessary to examine studies which relate age to performance in small firms. Studies that specifically relate to the relationship between age and performance in small businesses have reported mixed findings. Cooper and Gascon (1992) report that the differences in findings could be a factor of how the constructs were
defined. Some studies found that older entrepreneurs are less likely to grow and be effective (Begley & Boyd, 1985; Cragg & King, 1988; Dunkelberg & Cooper, 1982). On the other hand, there are other findings that support that there is a positive relationship between age and effectiveness (including income) (Brockhaus, 1980; Cooper, Dunkelberg & Woo, 1988; Denison & Alexander, 1986).

One suggestion cited for facilitating better understanding of the age-effectiveness relationship is to examine whether there are certain contexts (Guthrie & Olian, 1991) or industries (Cooper & Gascon, 1992; Liles, 1974) within which younger or older entrepreneurs do better. For instance, some studies indicate that the average age of entrepreneurs in high-technology businesses is lower compared to entrepreneurs in other types of businesses (e.g., see Teach et al., 1985, 1986). As can be seen, several aspects of age need to be examined when studying the association of age and team interpersonal process effectiveness. An overview of the literature examined in this section is presented in Table 7.

**TABLE 7. Overview of Literature on Age and Team Interpersonal Process Effectiveness**

<table>
<thead>
<tr>
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<td>Age ---&gt; Leadership</td>
<td>Shaw</td>
<td>1981</td>
<td>*1</td>
</tr>
<tr>
<td></td>
<td>Stogdill</td>
<td>1948</td>
<td>*1</td>
</tr>
<tr>
<td>Age ---&gt; Interpersonal</td>
<td>Daboub, Rasheed, Priem,</td>
<td>1995</td>
<td>-</td>
</tr>
<tr>
<td>Flexibility</td>
<td>&amp; Gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smith &amp; Hoy</td>
<td>1992</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Wiersema &amp; Bantel</td>
<td>1992</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Carlsson &amp; Karlsson</td>
<td>1970</td>
<td>-</td>
</tr>
<tr>
<td>Age ---&gt; Team Commitment</td>
<td>Gilbert, Brenner, &amp; Brenner</td>
<td>1990</td>
<td>-</td>
</tr>
<tr>
<td>Age ---&gt; Helpfulness</td>
<td>Gilbert, Collins, &amp; Brenner</td>
<td>1990</td>
<td>*2</td>
</tr>
</tbody>
</table>

Table 7 (continued)
### TABLE 7 (Continued)

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Author(s)</th>
<th>Year</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Homogeneity (\rightarrow) Interaction &amp; Communication</td>
<td>Zenger &amp; Lawrence</td>
<td>1989</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Pfeffer</td>
<td>1983</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Kanter</td>
<td>1977</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Rogers &amp; Bhowmik</td>
<td>1971</td>
<td>+</td>
</tr>
</tbody>
</table>

+ = There is a positive relationship  
- = There is a negative relationship  
*1 = Report that in a number of cases, leaders are older than nonleaders.  
*2 = Younger leaders were rated higher than older leaders in "friendship," "enjoyableness," and "partner behavior."

### Age Heterogeneity

Shaw (1981) stated that many theorists believe that heterogeneity-homogeneity dimension is the most important dimension with respect to group composition. The assertion that heterogeneous groups are more effective than homogeneous groups has been made in past research (Hurst, Rush, & White, 1989). Ziller (1972) concluded that productivity is improved by heterogeneity on a wide variety of variables including age, ability, race, personality, and training. Because most teams require a variety of skills, abilities, and knowledge, the more heterogeneous a group, "the more likely the necessary abilities and information will be available and the more effective the group is likely to be" (Shaw, 1981: 238). Enhanced creativity and innovation have also been shown (Bantel & Jackson, 1989; Katz, 1982; Wanous & Youtz, 1986), result from the challenges that team members can present each other in a heterogeneous team (Hoffman & Maier, 1961).
People of similar age, regardless of their background characteristics like status, expertise, tenure in organization, tend to have common experiences that may not necessarily be work related (Zenger & Lawrence, 1989). These could arise from the fact that people share similar points in their family lives (Lawrence, 1980). Ryder wrote that a group of people of similar age have "a distinctive composition and character reflecting the circumstances of its unique origin and history" (1965: p. 845) (also called age cohorts [Carlsson & Karlsson, 1970]). These common non-work-related experiences produce shared beliefs, interests, and attitudes among people of similar age inside the workplace (Rhodes, 1983). For instance, there is evidence of a positive relationship between age and job involvement (Saal, 1978), and age and commitment (Morris & Sherman, 1981).

Because age similarity produces common interests, attitudes, and beliefs, there is increased interaction and communication between individuals of same age group (Kanter, 1977; March & Simon, 1958; Pfeffer, 1981, 1983; Riley, Johnson, & Foner, 1972; Ryder, 1965; Simmel, 1950; Zenger & Lawrence, 1989). In a study of dyads, Rogers and Bhowmik (1971) found that dyads of similar individuals communicate more effectively and frequently than dyads of dissimilar individuals.

According to Pfeffer (1983), however, having heterogeneity of age groups can be a hindrance to the effectiveness of a group. He argues that variability in age can create conflicts among team members, because differences in background of workers lead to disagreements, which may hinder team cohesiveness. Additionally, variability in membership may create divisions or rifts between cohorts, and may isolate those not belonging to a particular cohort (Zenger & Lawrence, 1989). For instance, research
indicates that turnover is higher in groups whose members vary more widely in age (Wagner, Pfeffer, & O'Reilly, 1984). So although diversity in ages may be an asset from the point of view of enhancing performance, it may negatively impact the way a group interacts and communicates. An overview of literature examined in this section is presented in Table 7.

**Average Level of Education**

The recent empirical research on demographics in organizations has focused on age and tenure as the main factors for studying the impact of demographic characteristics (e.g., McCain, O'Reilly, & Pfeffer, 1983; Wagner, Pfeffer, & O'Reilly, 1984; Zenger & Lawrence, 1989). Far less attention has been given to education in such studies (Tsui, Egan, & O'Reilly, 1992). Such a focus may have a limiting effect on assessing and understanding the full impact of demography (Pfeffer, 1983; Tsui & O'Reilly, 1989). Other researchers suggest the inclusion of variables such as education and gender, rather than studying one or two isolated variables (Stangor, Lynch, Duan, & Glass, 1992, Tsui & O'Reilly, 1989; Turner, 1987).

In their studies of the top management team composition, Bantel and Jackson (1989), and Wiersema and Bantel (1992) reported that a higher level of education was positively associated with innovation, and change in strategic corporate strategy. Some studies have also associated high levels of education with receptivity to innovation (Becker, 1970; Kimberly & Evanisko, 1981; Rogers & Shoemaker, 1971). It is indicated
that the level of education is correlated with cognitive abilities and skills (Bantel, 1993; Bantel & Jackson, 1989; Cho, Hambrick, & Chen, 1994; Hambrick and Mason, 1984; Wiersema and Bantel, 1992). In fact, formal education can serve as a proxy for potential and ability in individuals (Cox & Nkomo, 1992). High levels are associated with a higher capacity for information processing and the ability to distinguish between various stimuli (Schroeder, Driver, & Streufert, 1967). Higher levels of education are also associated with the ability to tolerate ambiguity, to integrate complexity (Dollinger, 1984), and to coordinate decisions across people and units (Bantel, 1993). Bantel and Jackson (1989) also found that higher levels of education are associated with significance or "quality" of decisions. A study sponsored by the American Assembly of College Schools of Business (1987) found that those with graduate degrees scored higher than those with undergraduate degrees on ratings of skills such as leadership, planning and communication. Recruits with higher degrees are also more likely to have training and experience in working in team environments (Lavigna, 1992).

With respect to job satisfaction, it has been proposed that there is an inverse relationship between level of education and job satisfaction (e.g., Westley & Westley, 1971). However, survey data do not support this hypothesized relationship (Wright & Hamilton, 1979). Survey data do support the view that better educated workers want a say in decision making (Lawler, Renwick & Bullock, 1981). Lawler (1985) pointed out that the education level also affects the style of management that a firm may employ. The chosen style of management needs to be congruent with the education level of workers (Katz & Kahn, 1978; Likert, 1961). For instance, the higher educated workers desire
decentralization, increased control, and skill utilization, and tend to favor team style management (Hackman & Suttle, 1977; Lawler, 1985). At the same time, participative systems require education that provides interpersonal and technical skills (Lawler, 1985). If the workers are not provided these opportunities, they are likely to leave. Education causes people to have different expectations and preferences with respect to work, and highly educated people do expect to change jobs more often (Lawler, 1985). In fact, some investigations (e.g., Mottaz, 1984; Timmons, 1990) have found a negative relationship between education and commitment.

Furthermore, it is argued that given the increase in knowledge work and technology-based work, which require organic and participative management styles, higher levels of education may be necessary for such work (Lawler, 1985; Teach et al., 1985). When studied in the context of small businesses, it has been the general finding of some investigations that high-technology entrepreneurs have a higher level of education than the general population (Cooper & Dunkelberg, 1987; Roberts, 1972; Stuart & Abetti, 1988; Teach et al., 1985). In a cross-sectional study of 1800 high-technology entrepreneurs, Cooper and Dunkelberg (1987) reported that the average education level was between 13 and 15 years of schooling. Similarly, Roberts (1972), in his study of high-technology entrepreneurs in Boston, found that the average level of education was a masters degree. Teach et al., (1985), in their study of software entrepreneurs, indicated that over 45 percent of the entrepreneurs had advanced degrees (a masters degree or higher), with 28 percent having a doctorate degree.
Theoretically, there are mixed indications as to how the level of education might affect performance (Cooper & Gascon, 1992) in small firms. Cooper and Gascon stated that "viewing the entrepreneur as the primary resource of a new firm, we might expect that more education would lead to greater success" (1992: 306). Bates (1990) examined firms that started between 1976 and 1982, and concluded that the highly educated entrepreneurs were most likely to remain in operation through 1986. He found that highly educated owners (those with four or more years of college education) were more likely to create viable and lasting firms than their poorly educated counterparts. Similarly, other studies have hypothesized that greater educational attainment facilitates growth and financial performance, and longer employment (Hambrick & Mason, 1984; Norburn, 1986; Veum & Weiss, 1993).

In a study of the impact of education on performance, Cooper and Gascon (1992) reviewed 17 studies, of which 10 indicated a positive relationship between education and performance, six had insignificant results, and one reported a negative relationship. In the study that reported a negative relationship, the researchers (Stuart & Abetti, 1988) found that entrepreneurs with doctoral degrees did "less well than" those with masters degrees. These findings were also supported by Roberts' study (1972), in which he found that entrepreneurs with masters degrees did better than those with more or less education.

There are also others who contend that formal education impedes the entrepreneurial process by reducing curiosity and willingness to take risks (Bird, 1989; Fallows, 1985; Shapero, 1980). Despite these criticisms, there is evidence that formal
education has a positive impact on entrepreneurship (Bird, 1989; Ronstadt, 1984). An overview of literature pertaining to education is summarized in Table 8.

**Educational Heterogeneity**

Another dimension of education relates to the different types of formal educational backgrounds that team members bring to a team. Research evidence indicates that the choice of curriculum indicates an individual's cognitive style, personality, and attitudes (Holland, 1976). In turn, the line of curriculum pursued shapes perspectives and opinions (Bantel, 1993; Wiersema & Bantel, 1992). For example, Wiersema and Bantel (1992) indicate that science and engineering fields are more oriented towards invention, progress, and improvement than the arts, law, and business. Therefore, the educational training of individuals reflects their thinking and the way they apply their skills and knowledge.

The literature on homogeneity and heterogeneity states that for complex tasks and situations, heterogeneity in membership is preferable to homogeneity (Filley, House, & Kerr, 1976; Hambrick & Mason, 1984; Hoffman & Maier, 1961). Teach et al., (1986) noted in their study on software entrepreneurs, that a greater variety of educational backgrounds related to the success of the firm. Heterogeneity of educational backgrounds within a team is likely to broaden perspectives on decision making (Wiersema & Bantel, 1992), problem solving (Bantel & Jackson, 1989), and planning (Bantel, 1993). In their study of the relationship between top management team characteristics and innovation, Bantel and Jackson (1989) found that there was a positive association between
heterogeneity of educational curricula and innovativeness. Heterogeneity of educational backgrounds, thus, seems to offer some benefits. An overview of the literature discussed in this section is presented in Table 8.

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Author(s)</th>
<th>Year</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education --- Leadership</td>
<td>AACSB</td>
<td>1987</td>
<td>+</td>
</tr>
<tr>
<td>Education --- Team Commitment</td>
<td>Timmons</td>
<td>1990</td>
<td>- ^2</td>
</tr>
<tr>
<td></td>
<td>Lawler</td>
<td>1985</td>
<td>* ^1</td>
</tr>
<tr>
<td></td>
<td>Mottaz</td>
<td>1984</td>
<td>+ ^2</td>
</tr>
<tr>
<td></td>
<td>Hackman &amp; Suttle</td>
<td>1977</td>
<td>- ^1</td>
</tr>
<tr>
<td>Education --- Performance</td>
<td>Cooper &amp; Gascon</td>
<td>1992</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Bates</td>
<td>1990</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Stuart &amp; Abetti</td>
<td>1988</td>
<td>- ^3</td>
</tr>
<tr>
<td></td>
<td>Hambrick &amp; Mason</td>
<td>1984</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Roberts</td>
<td>1972</td>
<td>- ^3</td>
</tr>
<tr>
<td>Education --- Risk-taking</td>
<td>Bird</td>
<td>1989</td>
<td>-</td>
</tr>
<tr>
<td>Education --- Technology-based Work</td>
<td>Cooper &amp; Dunkelberg</td>
<td>1987</td>
<td>+ ^4</td>
</tr>
<tr>
<td></td>
<td>Teach, Tarpley, &amp; Schwartz</td>
<td>1986</td>
<td>+ ^4</td>
</tr>
<tr>
<td></td>
<td>Lawler</td>
<td>1985</td>
<td>+ ^4</td>
</tr>
<tr>
<td></td>
<td>Roberts</td>
<td>1972</td>
<td>+ ^4</td>
</tr>
<tr>
<td>Educational Heterogeneity --- Success</td>
<td>Teach, Tarpley, &amp; Schwartz</td>
<td>1986</td>
<td>+</td>
</tr>
<tr>
<td>Educational Heterogeneity --- Innovation</td>
<td>Bantel &amp; Jackson</td>
<td>1989</td>
<td>+</td>
</tr>
<tr>
<td>Educational Heterogeneity --- Broader (# of Perspectives</td>
<td>Bantel</td>
<td>1993</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Wiersema &amp; Bantel</td>
<td>1992</td>
<td>+</td>
</tr>
</tbody>
</table>

+ = There is a positive relationship  
- = There is a negative relationship  
* ^1 = Higher educated workers favor team style management  
* ^2 = Found negative relationship between level of education and organizational commitment  
* ^3 = Found that entrepreneurs with doctoral degrees did "less well than" those with masters degrees  
* ^4 = High technology entrepreneurs have higher education than other entrepreneurs
Gender Heterogeneity

The inexorable influx of women into the workforce over the past half century is shifting the gender balance in organizations. Paralleling the shift of women into the workforce, is a growing number of women starting their own business. While in 1972 less than five percent of all U.S. small businesses were owned by women, a much higher percent (greater than 25 percent) are now owned by women. Women are beginning businesses at twice the rate as men (U.S. Government Printing Office, 1985). In spite of the growing number of women-owned businesses, however, most remain small, in terms of gross receipts and number of employees (Bowen & Hisrich, 1986; Brush & Hisrich, 1991). Because of the nascent nature of the field, so far, there has been little research on factors affecting their start-up and growth (Brush & Hisrich, 1991).

Because women will continue to make up a growing portion of the labor pool, there is a need to understand gender differences to improve communication, productivity, effectiveness and performance (Halterman, Dutkiewicz, & Halterman, 1991). In response to this need, research on gender differences in entrepreneurial characteristics is beginning to receive a considerable amount of attention (Fischer et al., 1993). The empirical findings and recommendations that have been reported, however, are diverse, many of which have been questioned (Fischer, Reuber, & Dyke, 1993; Sexton & Bowman-Upton, 1990; Wood, 1987). For instance, while some studies report notable differences in traits and experiences of male and female entrepreneurs (e.g., Sexton & Bowman-Upton, 1990), there are others which suggest few differences between the two (e.g., Buttner & Rosen,
1989; Riding & Swift, 1990). Similarly, Brief and Oliver (1976) found that there were no differences in work attitudes between men and women. Goktepe and Schneier (1989) reported that there is no way to predict differences in leadership potential between men and women. Consequently, because of the wide spectrum of findings in this area, which are often inconclusive and varied, there has been a call for theory-driven research in this area (Low & MacMillan, 1988).

When examined from an interaction perspective, similar non-converging or diverse results have been reported. Although limited, there is some evidence that the gender composition of a group has an impact on interaction styles, leadership behavior, and performance (Shaw, 1981) (see Table 9 for a summary).

Some studies have found that men are more satisfied with their jobs when they make more money, and when they can supervise more people (Brenner & Tomkiewicz, 1979; Wood & Polek, 1985). On the other hand, women like jobs in which they can develop new skills, and interact with friendly co-workers (Brenner & Tomkiewicz, 1979; Halterman & Halterman, 1989; Wood & Polek, 1985).

Speaking overall, Wood (1987), in a meta-analytic review of gender differences in group performance, found that all-male groups generally perform better than all-female groups. She claimed, however, that a group's success really depends upon how well the interaction style of its members fits the requirements of their task. Female group members' interaction style facilitated performance of tasks requiring more social activities (e.g., friendliness and agreement with other members). Men's interaction style worked better at tasks requiring agentic activities (e.g., giving opinions and information). This follows
TABLE 9. An Overview of Literature on Gender and Team Interpersonal Process Effectiveness

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Author</th>
<th>Year</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender ---&gt; Leadership</td>
<td>Goktepe &amp; Schneier</td>
<td>1989</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Maslach</td>
<td>1974</td>
<td>+M *1</td>
</tr>
<tr>
<td>Gender ---&gt; Interpersonal Flexibility</td>
<td>Shaw</td>
<td>1981</td>
<td>+MF *2</td>
</tr>
<tr>
<td>Gender ---&gt; Team Commitment</td>
<td>Aven, Parker, &amp; McEvoy</td>
<td>1993</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td>Powell</td>
<td>1993</td>
<td>NC</td>
</tr>
<tr>
<td></td>
<td>Goodman, Ravlin, &amp; Schminke</td>
<td>1987</td>
<td>+M *3</td>
</tr>
<tr>
<td></td>
<td>Hrebiniak &amp; Alutto</td>
<td>1972</td>
<td>+F *4</td>
</tr>
<tr>
<td>Gender ---&gt; Helpfulness</td>
<td>Halterman &amp; Halterman</td>
<td>1989</td>
<td>+F *5</td>
</tr>
<tr>
<td></td>
<td>Wood</td>
<td>1987</td>
<td>+F *5</td>
</tr>
<tr>
<td></td>
<td>Brenner &amp; Tomkiewicz</td>
<td>1979</td>
<td>+F *5</td>
</tr>
</tbody>
</table>

N = No difference in leadership potential of men and women
*1 = Males report greater desire for leadership roles than women
*2 = Both men and women conform more in mixed-sex groups than in same-sex groups
NR = Found that gender and commitment are unrelated
*3 = Men are more committed to the organization than women
*4 = Women are more committed to the organization than men
NC = No consensus regarding gender and organizational commitment
*5 = Females prefer friendly and cooperative activities

some previously reported studies which state that women appear to do better than men at verbal tasks, whereas men outperform women at tasks requiring quantitative and visual-spatial skills (Hyde, 1981; Rosenthal & Rubin, 1982). This explanation for possible gender differences is based on Bales' (1970) interaction process analysis which distinguishes between active task behavior (exhibited by men) and positive social behavior (exhibited by women). Several studies have documented this difference in interaction
styles between men and women (e.g., Anderson & Blanchard, 1982; Baird, 1976; Lockheed, 1985).

Wood (1987) suggests that a reason why there may be a difference between the performance between men and women is that interpersonal behavior may divert the group's attention from task completion. Because women may be involved in more positive social activity than men, that may reduce productivity. On the other hand, there may be situations where social activity is highly productive resulting from encouraging team members to contribute to a given situation and resulting in the female groups outperforming men's groups. However, Wood (1987) also found that when comparing mixed-gender groups with same-gender groups, there was a slight tendency for mixed-gender groups to outperform same-gender groups.

Similar results have been reported by some other researchers. For instance, given that men and women have different interaction styles, which impact behaviors (Shaw, 1981), the quality of a mixed-gender group's problem solving and decision making is likely to be higher because of differing perspectives, than when group members are homogeneous (Shaw, 1981). Hence, mixed-gender groups should be more effective than same-gender groups (Hoffman, 1965; Shaw, 1981).

Hoffman and Maier (1961) compared same-gender and mixed-gender groups as they interacted in problem-solving, role-playing, and case discussions. Three gender compositions were studied, including all-male groups, groups with three males and one female, and groups composed of two or three females and one or two males. It was found that mixed-gender groups performed better than same-gender groups on all problems.
In another study Ruhe (1978) used three member groups (a leader and two followers) to place six trainees. Male and female leaders worked with both mixed-gender and same-gender followers. It was found that the heterogeneous groups performed better than the homogeneous groups, and in fact, the poorest performance was by the all-male group.

Contrary to these findings, some researchers have reported a different conclusion. Hare (1976) argued that same-sex groups may be more efficient than mixed-sex groups because they spend less time in social-emotional activities. Clement and Schiereck (1973) also echoed the same conclusion in a study stating that the presence of members of the opposite sex may be distracting.

When the composition of a team is studied with respect to leadership, it has been seen that men in single-gender groups report a greater desire for leadership roles than women (Maslach, 1974). Women, on the other hand, select more participative leadership strategies than men (Jago & Vroom, 1982). Another study (Fennell, Barchas, Cohen, McMahon, & Hilderbrand, 1978) reported that all-male groups were more likely to have a centralized leader who is the greatest contributor to group performance, than all-female groups. Additionally, a study done by Tuddenham, MacBride, and Zahn (1958), concluded that men conformed more in same-gender groups than in mixed-gender groups. Somewhat different than these results, one investigation reported that a leader was less likely to emerge in homogeneous groups than in heterogeneous groups, and that groups with a leader were more likely to reach consensus regarding decisions to be made (Dyson, Godwin, & Hazelwood, 1976). The reason for this was explained by Shaw (1981) as both
men and women conforming more in mixed-sex groups than in same-sex groups (contrary to what was reported by Tuddenham et al., 1958). In a 1964 study, Reitan and Shaw found that members of mixed-gender groups were more concerned about disagreements than members in the same-gender groups. They interpreted these findings as group members having more concern for interpersonal relations and a desire to conform to the expectations of others in mixed-sex groups than in same-sex groups.

When gender has been studied with respect to commitment, Powell (1990) indicates that no consensus has been reached. The job model of commitment argues that both men and women have the same level of commitment, whereas the gender model suggests that men and women differ in their levels of commitment (Feldberg & Glenn, 1979, Gutek & Cohen, 1987). Group task orientation is indicative of higher levels of commitment to group goal achievement, leading to higher effectiveness (Goodman, Ravlin, & Schminke, 1987). Men have been shown to be more task oriented than women, and hence, should be more committed. In contrast, Hrebiniak and Alutto's (1972) study showed that women are more committed than men. In a meta-analysis, however, Aven, Parker, and McEvoy (1993) found that gender and attitudinal commitment are unrelated.

**Functional Background Heterogeneity**

Each team member brings a unique set of attitudes and opinions to the team. Each member offers an orientation that, in part, has been derived from experience in some functional area (Hambrick & Mason, 1984). Hambrick and Mason (1984) indicated that
functional backgrounds are important indicators of cognitive perspectives. The functional backgrounds are likely to shape attitudes, perspectives, and knowledge (Dearborn & Simon, 1958; Gupta & Govindarajan, 1984; Hambrick & Mason, 1984), and subsequent career success (Howard, 1986). Even though the functional background may not be the dominant criterion in making strategic choices and decisions, it can be expected to exert some influence (Hambrick & Mason, 1984). For instance, Dearborn and Simon (1958) presented a group of executives with a case study and asked them to come up with solutions. Those executives defined the problem largely from their functional background perspective.

Homogeneity of functional backgrounds contributes to cohesiveness in a team by providing common frames of reference and schemata for problem solving (Michel & Hambrick, 1992). Cohesion facilitates internal communication and collaboration in a team (Barnard, 1938; Roberts & O'Reilly, 1979; Rogers & Bhowmik, 1971; Wagner, Pfeffer, & O'Reilly, 1984). Among team members of similar functional backgrounds, a shared language develops which enhances communication frequency and integration (O'Reilly, Caldwell, & Barnett, 1989; Zenger & Lawrence, 1989). Table 10 presents a summary of literature related to functional background.

The alternate side of having homogeneity in functional backgrounds, however, is that such homogeneous teams can be expected to show conformity and lack of openness to information (Wiersema & Bantel, 1992). It has also been shown to associate with high commitment to prior courses of action, and being inflexible (Janis, 1982). Whitney and
TABLE 10. Overview of Literature on Functional Background (FB) and Team Interpersonal Process Effectiveness

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Author(s)</th>
<th>Year</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB --&gt; Interpersonal Flexibility</td>
<td>Wiersema and Bantel</td>
<td>1992</td>
<td>- *1</td>
</tr>
<tr>
<td></td>
<td>Janis</td>
<td>1972</td>
<td>- *1</td>
</tr>
<tr>
<td>FB --&gt; Helpfulness</td>
<td>Wagner, Pfeffer, &amp; O'Reilly</td>
<td>1992</td>
<td>+ *2</td>
</tr>
<tr>
<td></td>
<td>Zenger &amp; Lawrence</td>
<td>1989</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity of FB</td>
<td>Bantel &amp; Jackson</td>
<td>1989</td>
<td>+</td>
</tr>
<tr>
<td>--&gt; Creativity, Innovation</td>
<td>Murray</td>
<td>1989</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Wanous &amp; Youtz</td>
<td>1986</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity of FB</td>
<td>Sorensen</td>
<td>1968</td>
<td>+ *3</td>
</tr>
<tr>
<td>--&gt; Cross-functional Communication</td>
<td>Ghiselli &amp; Lodahl</td>
<td>1958</td>
<td></td>
</tr>
<tr>
<td>Heterogeneity of FB</td>
<td>Cooper &amp; Gascon</td>
<td>1992</td>
<td>+</td>
</tr>
<tr>
<td>--&gt; Performance</td>
<td>Eisenhardt &amp; Schoonhoven</td>
<td>1989</td>
<td>NS *4</td>
</tr>
<tr>
<td></td>
<td>Teach, Tarpley, &amp; Schwartz</td>
<td>1986</td>
<td>+</td>
</tr>
</tbody>
</table>

+ = There is a positive relationship
- = There is a negative relationship
*1 = Homogeneity of functional background may lead to lack of openness and inflexibility
*2 = Homogeneity of functional background facilitates communication and collaboration in a team
*3 = Need to reconcile diverse perspectives encourages group discussions, resulting in high quality decisions
*4 = No significant relationships

Smith (1983) indicate that such inflexibility would interfere with the team's ability to utilize the information available to it.

In contrast to homogeneity of functional backgrounds, when a breadth of perspectives and opinions is available to a team, the team tends to gather information from a variety of sources, and has diverse perspectives and interpretations (Wiersema & Bantel, 1992). Dutton and Duncan (1987) propose that when a variety of perspectives is available, it enhances the search for information. Research has also indicated that
heterogeneity on functional background is linked to creativity, flexibility, and innovation (Bantel & Jackson, 1989; Murray, 1989; Wanous & Youtz, 1986) resulting from the ability of team members to challenge each other (Hoffman & Maier, 1961). A need to reconcile diverse perspectives and viewpoints encourages effective group discussions, resulting in high quality decisions (Ghiselli & Lodahl, 1958; Hoffman, 1959; Sorensen, 1968). This is based on contact theory, which proposes that when there is direct interpersonal contact between antagonistic members, it will reduce negative attitudes (Allport, 1954). In fact, cross-functional communication has been established as a precursor to innovation (Shrivastava & Souder, 1985; Bantel & Jackson, 1989).

In a study of small firms, Cooper, Dunkelberg, & Woo (1988) pointed out that the background experience of team members would have a bearing on the outcome of the firm. Cooper and Gascon (1992) posited that greater breadth of experience would lead to higher performance. Doutriaux and Simyar (1987) found that marketing experience led to higher sales. Dunkelberg and Cooper (1982), however, did not find any relationship between marketing, finance, engineering, or production experience and growth. Eisenhardt and Schoonhoven (1989) studied heterogeneity of functional experience in a team and found no significant relationships.

**Team Size**

While examining the relationships discussed in the previous sections, it is essential to recognize that there may be other variables that may be correlated with team
interpersonal process effectiveness, and need to be controlled for in this study. Team size is one such variable.

Team size has been shown to affect group processes and outcomes. According to Shaw (1981), the number of persons in a group has important consequences for the group process. On one hand, the range of abilities, perspectives, and knowledge and skills available to the group increases as the size of the group increases. On the other hand, as the group size increases, the number of interpersonal relationships in the group increases as well. Subgroups are more likely to form, which may increase the number of potential conflicts (Shaw, 1981).

Although acknowledged as an important factor influencing effectiveness (Teach et al., 1986), team size has not received much attention in the theoretical team literature (Bantel & Jackson, 1989). While some effectiveness models have considered team size as a structure issue or as an input in the study of outcomes of teams (Gladstein, 1984; Hackman, 1987; McGrath, 1964), others have examined it as a control variable because of its potential influence on outcomes (e.g., Bantel, 1993; Bantel & Jackson, 1989; Waller & Huber, 1994; Wiersema & Bantel, 1992). The relationship between team composition and outcomes is not constant, but is thought to vary with the size of the team.

When studying group size with respect to leadership, Shaw (1981) noted from the data reported by Bales, Strodbeck, Mills, and Rosenborough (1951) that the leadership role is assumed more in groups as they increase in size (see Table 11). The explanation for this was based on the research available for relationship between group size and participation. As the size of a group increases, the opportunity available to each member
TABLE 11. An Overview of Literature on Team Size and Team Interpersonal Process Effectiveness

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Author(s)</th>
<th>Year</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size ---&gt; Leadership</td>
<td>Shaw</td>
<td>1981</td>
<td>+</td>
</tr>
<tr>
<td>Size ---&gt; Interpersonal Flexibility</td>
<td>Kerr</td>
<td>1989</td>
<td>- *1</td>
</tr>
<tr>
<td></td>
<td>Markham, Dansereau, &amp; Alutto</td>
<td>1982</td>
<td>- *1</td>
</tr>
<tr>
<td>Size ---&gt; Team Commitment</td>
<td>Levine &amp; Moreland</td>
<td>1990</td>
<td>- *2</td>
</tr>
<tr>
<td></td>
<td>Bird</td>
<td>1989</td>
<td>- *2</td>
</tr>
<tr>
<td></td>
<td>Shaw</td>
<td>1981</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Indik</td>
<td>1965</td>
<td>- *2</td>
</tr>
<tr>
<td>Size ---&gt; Helpfulness</td>
<td>Wegner &amp; Schaefer</td>
<td>1978</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Segal</td>
<td>1977</td>
<td>- *3</td>
</tr>
<tr>
<td></td>
<td>Darley &amp; Latane</td>
<td>1968</td>
<td>-</td>
</tr>
<tr>
<td>Size ---&gt; Involvement</td>
<td>McGrath</td>
<td>1984</td>
<td>-</td>
</tr>
<tr>
<td>Size ---&gt; Cohesion</td>
<td>Gladstein</td>
<td>1984</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>O'Reilly &amp; Roberts</td>
<td>1977</td>
<td>-</td>
</tr>
</tbody>
</table>

+ = There is a positive relationship  
- = There is a negative relationship  
*1 = Less likely to participate and cooperate with one another  
*2 = Decreased participation in group activities  
*3 = Friendships did not increase as much as potential friends available in a group increased.

to express his or her opinions, and to participate in group discussions decreases (Shaw, 1981). Members often feel more inhibited to participate in larger groups than in smaller groups (Gibb, 1951). Indik (1965) found that the rate of communication also decreases as the size of groups increases, leading to lower interpersonal communication and interaction. Consequently, with decreased communication, the gap between the most active person and other members in the group widens, leading to the leadership role being assumed by one person with the exclusion of other members (Bass & Norton, 1951; Hemphill, 1950; Shaw, 1981).
As the group grows in size, members of larger groups are less attracted to the group, are less satisfied with it, and experience more tension (Katz, 1949; Shaw, 1981). In addition, the increased difficulty of maintaining close interpersonal relationships with other members of the group leads to negative feelings for the group. When it comes to making friends with the fellow members of the group, Segal (1977) found that although choices to make friends increased with an increase in group size, they did not increase as much as would have been expected on the basis of potential friends available in the group. Some investigations have revealed that group members in larger groups are less likely to be helpful to other members in the group as compared to members of a smaller group (e.g., Darley & Latane, 1968; Latane & Rodin, 1969; Wegner & Schaefer, 1978).

Also, as a group increases in size, other changes among group members occur, generally for the worse (Levine & Moreland, 1990). Group members of larger groups participate less in group activities, are less likely to cooperate with one another (Kerr, 1989; Markham, Dansereau, & Alutto, 1982), and may misbehave more, perhaps because of increased anonymity (Latane, 1981; Prentice-Dunn & Rogers, 1989). Such potential for negative feelings towards other members in a group, coupled with a reduction in participation, may decrease commitment in larger groups.

As Bird (1989) indicates, the simplest venture team is composed of two people, and involves two personalities, and two sets of abilities. Their relationship depends upon interpersonal dynamics such as liking, conflict, leadership, trust, and communication. Things, however, get more complex when the team size increases. Communications become much more complex as the size grows.
Increasing the size of a team may reflect an increase in coordination efforts among members (Steiner, 1972), social loafing (Latane, Williams, & Harkins, 1979), reduced involvement (McGrath, 1984; Wicker, Kirmeyer, Hanson, & Alexander, 1976), reduced connectedness (O'Reilly & Roberts, 1977), and lower cohesion (Gladstein, 1984; McGrath, 1984; O'Reilly & Roberts, 1977). Keeping in mind the possible complexities that may arise from larger groups, a consistent guideline that emerges from the literature suggests having the smallest number of people who can do the task (Goodman, et al., 1986; Guzzo & Shea, 1992; Hackman, 1987; Hackman & Walton, 1986; Steiner, 1972; Sundstrom, De Meuse, & Futrell, 1990).

Given the potential influence of team size on interpersonal processes within a team, team size is included as a control variable in this study. The literature discussed in this section is summarized in Table 11.

Research Model And Proposed Hypotheses

Based on the literature reviewed in this chapter, the research model in Figure 2 is proposed for the current study. The model is based on the framework suggested by Hambrick and Mason (1984) which advocates studying demographic characteristics of the dominant coalition in an organization in evaluating outcomes. The second part of the model is based on a study by Watson, Ponthieu, and Critelli (1995) which developed a measure to evaluate venture team interpersonal process effectiveness in venture dyads.
The model reflects the relationship between demographic characteristics of the dominant coalition of the venture team (the owners) and team interpersonal process effectiveness.

The independent variables are demographic factors, and are divided into trait and heterogeneity variables. The trait effects include average age and average level of education. The demographic heterogeneity variables include age heterogeneity, educational heterogeneity, gender heterogeneity, and functional background heterogeneity. The dependent variable is team effectiveness, which is defined in terms of the interpersonal process that takes place between venture team members. The model proposes that composition of the team, as determined by the demographic makeup, has an association with the effectiveness of the team interpersonal process.

FIGURE 2. Research Model

<table>
<thead>
<tr>
<th>Traits</th>
<th>Heterogeneity</th>
<th>Team Interpersonal Process Effectiveness (TIPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age</td>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Average Level of Education</td>
<td>Educational</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Functional Background</td>
<td>Functional Background</td>
<td></td>
</tr>
</tbody>
</table>

The following discussions leading to hypotheses are depicted in the research model and are tested in the current study:

1. **Average Age of Team Members**: Even though the findings of research on age of team members are somewhat mixed, based on the existing evidence, it can be expected that
younger venture team members will bring better cognitive resources to the team (Bantel, 1993; Bantel & Jackson, 1989; Wiersema & Bantel, 1992; Taylor, 1975). That is so, because as confirmed by the literature, as age increases, some cognitive faculties become less sharp. These include memory, learning, and reasoning abilities (Botwinick, 1977; Burke & Light, 1981; Elder, 1975). Also, as people age, the ability to integrate declines accompanied by increasing rigidity and inflexibility (Taylor, 1975; Wiersema & Bantel, 1992).

Gilbert, Collins and Brenner (1991) reported in their study that relationship-oriented leader behavior attributes were higher among the young leaders. In addition, as organizations move to more organic forms, older team members require more training and skill development in team and interpersonal behaviors than younger members who grew up in more group-oriented business culture (Gilbert, Collins, & Brenner, 1991). Finally, literature indicates that older workers are less likely to assume risk (Carlsson & Karlsson, 1970; Vroom & Pahl, 1971), and that there is a negative correlation between average age and innovativeness (Bantel & Jackson, 1989). Both risk taking and innovativeness have been identified as integral parts of entrepreneurial activity (Bird, 1989; Schumpeter, 1934). Consequently, the following hypothesis is proposed:

**Hypothesis 1:** There is an inverse association between average age of the team members and team interpersonal process effectiveness.

2. **Age heterogeneity:** Age cohorts undergo similar experiences which are likely to be different from those experienced by other cohorts. Consequently, age cohorts are likely to differ in their approach and attitudes toward situations (Bantel & Jackson, 1989).
Although a diversity of perspectives, values and attitudes may enhance team performance (Shaw, 1981), Pfeffer (1983) states that the variability can create conflict, and may, therefore, restrict team effectiveness (when defined in terms of interaction among team members). Based on this line of argument, teams consisting of members with more diverse ages are likely to be less effective. The following hypothesis is proposed:

**Hypothesis 2:** There is an inverse association between age heterogeneity of the team and team interpersonal process effectiveness.

3. **Average Level of Education:** If it is assumed that the attained level of education is associated with cognitive ability (Bantel & Jackson, 1989), then higher levels of education would enable the team members to be more analytical and handle more complex situations (Dollinger, 1984), as well as coordinate decisions across people and units (Bantel, 1993).

Some studies have found higher levels of education to be associated with higher receptivity to innovation (e.g., Bantel & Jackson, 1989; Becker, 1970; Kimberly & Evanisko, 1981; Rogers & Shoemaker, 1971), which is a significant part of an entrepreneurial activity (Bird, 1989; Schumpeter, 1934). Furthermore, recruits with higher degrees are more likely to have training and experience in working in team environments (Lavigna, 1992). Besides, it has also been observed that high technology entrepreneurs have a higher level of education than others (Cooper & Dunkelberg, 1987; Roberts, 1972; Stuart & Abetti, 1986; Teach et al., 1985). Consequently, it is expected that:

**Hypothesis 3:** There is a positive association between the average level of education of team members and team interpersonal process effectiveness.
4. Educational Background Heterogeneity: Evidence exists that the major area of study that people select relates to their aptitudes and cognitive styles (Holland, 1976). Hence, it can be expected that teams comprising members of dissimilar educational background would benefit from the variety and diversity of perspectives and opinions. These diverse ideas and perspectives would offer the team members the opportunity to examine others' points of view, and may facilitate effective interaction among team members (Teach et al., 1986). Consequently, given the research evidence relating to educational background heterogeneity, it is predicted that:

**Hypothesis 4:** There is a positive association between heterogeneity of educational backgrounds and team interpersonal process effectiveness.

5. Gender Heterogeneity: From the discussion in the literature review on the effect of gender on team effectiveness, it is noted that gender composition of groups exerts an influence on outcomes (Shaw, 1981). Although there are limited studies examining the effect of gender from an interaction perspective, overall it seems that results are indicative of mixed-gender or heterogeneous groups performing slightly better than the same-gender or homogeneous groups (Shaw, 1981; Wood, 1987). A plausible explanation of this superiority over same-gender groups is the heterogeneity of interaction styles that is available in such groups (Carli, 1982). Wood (1987: p. 68) very succinctly sums up in the following words:

"Maybe the combination of men's and women's interaction styles in mixed-sex groups equipped the group to be moderately effective both at tasks requiring task activity and at those requiring social activity. All-male groups would then be less effective than mixed-sex ones at tasks requiring social activity, and all-female groups would be less effective at tasks requiring task behavior, resulting in lower aggregate productivity scores for same-sex groups than for mixed-sex groups."
Despite the lack of definitive research in this area, it can be logically predicted that gender diverse teams are more effective than same gender teams. Consequently, the following hypothesis is proposed:

**Hypothesis 5:** There is a positive association between gender heterogeneity and team interpersonal process effectiveness.

6. **Functional Background Heterogeneity:** People with differing functional experiences will bring different attitudes, perspectives, and knowledge (Dearborn & Simon, 1958; Hambrick & Mason, 1984; Teach et al., 1986). Differences in previous work experiences are likely to impact cognitive perspectives (Bantel & Jackson, 1989) of team members. These can affect team members' attitudes and how they interact with each other.

High degree of functional background homogeneity enhances conformity to status quo and inflexibility. This homogeneity encourages team members to be closed to sources of new information.

On the other hand, heterogeneity of functional backgrounds available in a team has been shown to increase creativity, flexibility, and innovation. Such heterogeneity has also been linked to success and high performance factors in the small business literature. Heterogeneity of backgrounds, in fact, enhances discussion and interaction among team members by forcing them to reconcile differing viewpoints, thereby producing high quality decisions. In line with these findings, the following hypothesis is proposed:

**Hypothesis 6:** There is a positive association between heterogeneity among team members with respect to their functional background and team interpersonal effectiveness.

Table 12 is a summary of the expected direction for all research hypotheses.
TABLE 12. Direction of Hypotheses

| $H_1$ | Relationship between average age of team members and team interpersonal process effectiveness | - |
| $H_2$ | Relationship between heterogeneity of age of team members and team interpersonal process effectiveness | - |
| $H_3$ | Relationship between average level of education of team members and team interpersonal process effectiveness | + |
| $H_4$ | Relationship between heterogeneity of educational background of team members and team interpersonal process effectiveness | + |
| $H_5$ | Relationship between gender heterogeneity and team interpersonal process effectiveness | + |
| $H_6$ | Relationship between heterogeneity of functional background of team members and team interpersonal process effectiveness | + |

Chapter Summary

A review of literature on team interpersonal process effectiveness and the effect of demographic characteristics on team effectiveness is presented in this chapter. In the first section an overview of team interpersonal process effectiveness is provided. Literature pertaining to organizational effectiveness, work group performance, and entrepreneurial venture team effectiveness, that emphasizes interpersonal process effectiveness in teams is detailed. In the second section an understanding of diversity, with special reference to demographic diversity, and its impact on groups is provided. Demographic factors such as age, education, gender, functional background, and size of team with respect to their relationship with interpersonal process effectiveness in teams are reviewed. In the third section a research model based on the detailed review of literature in the previous two
sections is presented. The chapter is concluded by describing six specific hypotheses which are tested in the current study.
CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

In this chapter, the research procedure and methodology which are used in the current study is presented. A discussion of the sample and survey research issues is considered first. The construction of the research instrument and the measures used for the identified variables are addressed in the next section. Finally, the Data Analysis section, which includes the statistical methods used to analyze the collected data, is presented.

Target Population And Survey Procedure

The research issues identified in this study lend themselves to field study methods to gather data from venture team owners. Field survey research is conducted to collect data. According to Kerlinger (1986, p. 372) "field studies are nonexperimental scientific inquiries aimed at discovering the relations and interactions among sociological, psychological, and educational variables in real social structures." One of the most important reasons for using this research domain in this study is that there is a lack of field research in this area. Several scholars have called for more field research (e.g., Levine & Moreland, 1990; McGrath, 1986; Shea & Guzzo, 1987), as opposed to laboratory research on groups. Magjuka and Baldwin (1991) indicate that,
"given the paucity of research on the determinants of group effectiveness in field settings (Shea and Guzzo, 1987), the nature of the relationships between general group variables and subsequent effectiveness awaits more precise specification" (p. 794).

This study is conducted as an attempt to acknowledge the need for more field research in understanding team effectiveness.

From an extensive review of the literature in this area, it appears that the need for field studies stems from the nature of field research. Of all types of studies, field research is the closest to real life (Kerlinger, 1986). Field studies provide the richest context in which research can take place. Not only are field studies strong in realism and significance, but also they are theory oriented and highly heuristic. Given the need for more group research in natural settings (Hackman, 1987), a field study provides the best avenue to study venture teams.

There are certain weaknesses to a field study, however, that need to be addressed. For instance, its most serious weakness is its nonexperimental character. Also, because of the greater complexity of field situations, a field study lacks precision. Some of the other weaknesses include practical problems, such as feasibility, cost, sampling and time (Kerlinger, 1986). These are only potential weaknesses however, they can be addressed so that they are not real weaknesses (Kerlinger, 1986).

The relationship between demographic variables and team interpersonal process effectiveness in small business venture teams is examined in the computer related businesses (Industry Group Number 737) (SIC Manual, 1987). The target population is
small firms engaged in computer related businesses in a large midwest city in the United States.

The target location chosen should fulfill certain conditions in order to be included in the study. Goslin and Barge (1986) identify some general factors necessary for providing the right environment for high-technology start-ups. These include:

1. support infrastructure of university(ies),
2. several existing mature electronics or high technology businesses,
3. ancillary support firms, and
4. a venture capital market.

The city chosen fulfills all the above-mentioned conditions, and is therefore considered appropriate for this research.

The target of the survey is identified as the team comprising the owners of venture teams engaged in computer related businesses. The owners comprising a venture team are the equivalent of the top management team that has been studied for analyzing relationships between the characteristics of top management and strategic outcomes (e.g., Bantel, 1993; Bantel and Jackson, 1989; Wiersema and Bantel, 1992).

In this study, sample size is affected by level of analysis and the research domain chosen. One of the limitations of a field study is that it may involve high costs in terms of time, money and effort (Kerlinger, 1986). These factors are important considerations in choosing the sample size.

Because the unit of analysis in group research is the group (e.g., McGrath, 1986, Shea and Guzzo, 1987), and the entire group is treated as one unit, all the members of the
team need to be studied. This fact increases the number of members to be studied, thereby increasing costs of time, money, and effort. Consequently, the size of the sample is restricted because of cost constraints. The sample size, however, must yield an acceptable level of statistical power (Mazen, Graf, Kellog, and Hemmasi, 1987). Cohen and Cohen’s (1983) procedure for power analysis is used to determine a suitable sample size needed for an appropriate level of statistical power (0.80).

Research indicates that Type I errors (rejecting a true null hypothesis) have received more attention than Type II errors, and that Type II errors (failing to reject a false null hypothesis) should receive more attention (Mazen et al., 1987). Attention to the statistical power helps reduce the possibility of committing a Type II error (Cohen & Cohen, 1983).

Statistical power is calculated using the Number Cruncher Statistical System (NCSS) program (Hintze, 1993). Because no effect size is available from previous team research, power analyses are performed using small (0.1), medium (0.3) and large (0.5) effect sizes. Time and money constraints involved in conducting a field study like this research precludes the possibility of using a large sample given a small effect size. For example, with a small effect size, at alpha level of 0.05, a sample of 610 offers a power of 0.80, and alpha level of 0.1 requires a sample of 450 for a power level of 0.80 (see Appendix A). To achieve the conventional power of 0.80, a sample size of 610 (alpha = 0.05) or 450 (alpha = 0.1) is required.
For a medium effect size (0.3), at an alpha level of 0.05, for a target power of 0.80, a sample size of between 60 and 70 is required (Appendix A). At an alpha level of 0.1, however, the sample size required is between 40 and 50.

Using an alpha level of 0.05, with a large effect size of 0.5, and a target power of 0.80, the required sample for this study is determined to be 23 (see Appendix A). Using an alpha level of 0.1, and a large effect size, the required sample is 16 (see Appendix A).

Keeping the aforementioned numbers in mind, 86 firms in the city are identified for this research. Small firms engaged in computer related business (SIC 737) are targeted. These firms are identified through listings provided by the Chambers of Commerce in the area, peer referrals from other firms, and library research.

Fowler (1993) suggests enlisting the cooperation of respondents by sending an informative advance letter. The letter should effectively and accurately present the purposes of the project and should ensure that respondents will not be threatened by the task or the uses to which the data will be put. Assurance should be provided that cooperation is voluntary. In line with these suggestions, a letter was mailed to all the targeted firms informing them of the research project and its purpose, and soliciting participation (see Appendix B for the cover letter). These firms were then contacted personally on the phone, briefed about the study, and requested to participate in the study. For those agreeing to participate, appointment times were requested for the survey interview. Figure 3 summarizes the survey procedure.

If a firm declined to participate in the study, the next firm on the list was contacted in the same manner, and requested to participate. This procedure was used until all the 86
Identify Venture Team Owners of Computer Related Businesses

Mail Informative Advance Letter Presenting the Purpose of the Study

Contact all 86 Venture Teams by Phone to Solicit Participation in the Study

If Agree to Participate, Arrange for a Survey Interview

If Decline to Participate Contact Next Firm and Solicit Participation

Each venture partner was requested to fill out a form requesting demographic information (age, level of education, educational background, functional background, gender), and company information. Because having ownership in a venture has an effect on the work relationship, the partners were requested to evaluate themselves and the other partners on a 15 item team interpersonal process effectiveness grid (see Appendix C).

To encourage response rate (Dillman, 1978; Fowler, 1993), participants were invited to attend a meeting with other survey participants to discuss the aggregated findings of the study. Ultimately, after contacting all the 86 firms, only 40 agreed to participate. Data were, therefore, gathered from 40 firms.
Validity Issues

There are certain validity issues in conducting a field survey research that require special consideration. Although these issues are addressed in detail in Chapter V, a brief discussion of some potential concerns, and how they are dealt with is presented next.

One of the first concerns in establishing statistical conclusion validity is to ensure that the sample size is adequate to provide the conventional power of 0.80. Attention should be paid so that a small sample size is not responsible for nonsignificant findings. As discussed in the previous section, this issue has been addressed. Furthermore, a post hoc power analysis is also conducted (see Chapter V) to alleviate any concerns stemming from inadequate sample size. This issue should, therefore, not be a concern for this study.

To ensure further that statistical conclusion validity is not a concern for this study, assumptions of statistical analysis are addressed (see Chapter IV). In addition, the reliability and validity of the instrument used in this study is discussed in detail. Finally, an attempt is made to compare the characteristics of this sample with those of other nationwide studies to reflect the representativeness of this sample (see Chapter V).

There are always concerns when using self-reports and single source to gather data. Because the same source provides all the information, there is a risk that if there is a problem with that source, all measures will be distorted in the same manner and direction (Campbell & Fiske, 1959). This problem is known as common method variance. Certain steps can be taken to ensure against this concern. For instance, care should be taken to identify and select the right respondents. It is argued that upper-level informants are more
reliable than their lower-level counterparts (Miller & Roth, 1994). In this study, the owners are targeted as respondents, thus addressing this concern. Other researchers suggest using more than one measure and gathering information from more than one source to decrease the probability of common method variance. In the present study, wherever possible, secondary sources have been used to gather data and verify information. Although taking these steps does not eliminate the problem of common method variance, it helps reduce the probability of the occurrence of such a problem.

**Instrument And Measures**

Measures of demographic variables and team interpersonal process effectiveness are discussed in the following paragraphs. In the first section the instrument and measure of team interpersonal process effectiveness is discussed, and is followed by a section on demographic measures.

**Team Interpersonal Process Effectiveness Instrument Development**

The present study used a measure developed by Watson, Ponthieu and Critelli (1995) for defining team interpersonal process effectiveness (TIPE). The instrument, Team Interpersonal Process Effectiveness Grid (see Appendix C), examines the evaluations that venture team members make about their own and their partners' contribution to team interpersonal process.
Watson et al. (1995) use qualitative as well as quantitative methods to develop the measure. Daft (1983) and Jick (1979) advocate the use of both methods, and suggest combining them whenever possible. Watson et al. (1995) take a grounded theory approach proposed by some scholars (e.g., Patton, 1990; Strauss & Corbin, 1990) to describe team interpersonal process effectiveness. Their approach is a qualitative strategy which involves content analysis on the gathered data to identify crucial issues. Watson et al. (1995) state that although this approach is laborious, the richness of the data advances the understanding of this concept, because the definition of what constitutes team interpersonal process effectiveness is in a developmental stage.

The qualitative process of gathering data by the Watson et al. (1995) researchers was accomplished by conducting group discussions with work teams from a variety of businesses that were involved with many of the same issues as entrepreneurial teams. Watson et al. (1995) used a construct elicitation method in which each participant was required to write one interpersonal process characteristic of an effective work team on each of three cards provided. After that, the participants wrote an interpersonal process characteristic of an ineffective work team on each of three additional cards. Next, the participants wrote the opposite for each effective and ineffective description. Watson et al. (1995) called this pairing of bi-polar type characteristics as team effectiveness constructs. Thirty natural work teams (i.e., they were real identifiable groups, with one or more tasks to perform, operating in an organizational context [Hackman, 1990]) submitted cards. A procedure used for developing interpersonal constructs was adapted from content analysis methods which uses written responses in field settings. Fifteen bi-
polar constructs for evaluating team interpersonal process effectiveness emerged (see Appendix C).

After constructing the instrument, the researchers performed factor analysis to assess its reliability. Four factors emerged that the authors named Leadership (F1), Interpersonal Flexibility (F2), Team Commitment (F3), and Helpfulness (F4). These factors produced Cronbach's alphas of: $F_1 = 0.89$, $F_2 = 0.84$, $F_3 = 0.85$, $F_4 = 0.79$, respectively. Nunnally (1978) suggests that alpha values equal to 0.70 or higher are acceptable in the earlier stages of research, and that efforts to improve reliability over 0.80 may be a waste of resources. Given Nunnally's criterion of 0.70, the reliability coefficients for the instrument appear to be acceptable.

The present study adopts the same measurement scale as used by Watson et al. (1995). All the fifteen items are measured on a seven point scale, where one represents "least effective," and seven represents "most effective" (see Appendix). All self and partner ratings for each venture team on the Team Interpersonal Process Effectiveness fifteen-item instrument are summed to give a team score. This score is averaged to provide a single total score for each team.

**Demographic Information**

In addition to using the Team Interpersonal Process Effectiveness instrument originated by Watson et al. (1995), a questionnaire for gathering demographic information for all the owners of the venture teams is also used. Watson et al.'s (1995) instrument is
useful for a number of items in the demographic information questionnaire. Some modifications are made, however, with some questions being added and deleted to suit the specific needs of the present study. A summary of items relating to constructs and their sources is presented in Table 13.

**TABLE 13. Construction of Survey Instrument**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Items</th>
<th>Sources</th>
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</thead>
<tbody>
<tr>
<td><strong>Team Interpersonal Process Effectiveness</strong></td>
<td>1-15</td>
<td>Watson, Ponthieu &amp; Critelli, 1995</td>
</tr>
<tr>
<td><strong>Traits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>14</td>
<td>Van de Ven &amp; Ferry, 1980</td>
</tr>
<tr>
<td>Educational Level</td>
<td>17</td>
<td>Teach, Tarpley &amp; Schwartz, 1986</td>
</tr>
<tr>
<td><strong>Heterogeneity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education Background</td>
<td>17</td>
<td>Teach, Tarpley &amp; Schwartz, 1986</td>
</tr>
<tr>
<td>Gender</td>
<td>15</td>
<td>Originated</td>
</tr>
<tr>
<td>Functional Background</td>
<td>20</td>
<td>Teach, Tarpley &amp; Schwartz, 1985</td>
</tr>
<tr>
<td>Team Size</td>
<td>7</td>
<td>Teach, Tarpley &amp; Schwartz, 1986</td>
</tr>
</tbody>
</table>

Questions in the demographic questionnaire pertain to age, level of education, educational background, functional background, gender, and some other information relating to the informant and firm profile. Information is also gathered on the size of the venture teams. In the following section, analysis of measures is discussed. Each variable is presented separately.

*Analysis Of Measures*

In this section, the analysis of each variable is presented. It includes all the independent variables as well as the dependent variable. In addition, although the
instrument has been validated before, reliability tests are conducted because of the change in sample from which data are gathered.

**Demographic Variables**

Each independent variable is measured using a different technique. The scales are nominal, ordinal, or interval. A summary of variables and their measurements is provided in Table 14. Following that, the measure of each variable is detailed.

**TABLE 14. Summary of Variables and their Measurements**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Measurement Mode</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Interpersonal Process Effectiveness</td>
<td>Dependent Variable</td>
<td>Ordinal Scale</td>
<td>1-7</td>
</tr>
<tr>
<td>Demographic Traits</td>
<td></td>
<td></td>
<td>1 = Least Effective</td>
</tr>
<tr>
<td>Age</td>
<td>Independent Variable</td>
<td>Interval Scale</td>
<td>2 = 26-30 years</td>
</tr>
<tr>
<td>Educational Level</td>
<td>Independent Variable</td>
<td>Nominal Scale</td>
<td>3 = 31-35 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 = 36-40 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 = 41-45 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6 = 46-50 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7 = 51-55 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8 = 56-60 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9 = Above 61 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 = High School (12 Years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 = Some college (13 years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 = Associate Degree (14 years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 = Bachelor's Degree (16 years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 = Master's Degree (16 years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6 = Doctorate Degree (22 years)</td>
</tr>
</tbody>
</table>

Table 14 (continued)
**TABLE 14 (Continued)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Measurement Mode</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterogeneity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Independent Variable</td>
<td>Interval Scale</td>
<td>Blau’s Index: $1 - \sum p_i^2$</td>
</tr>
<tr>
<td>Educational</td>
<td></td>
<td></td>
<td>1 = Engineering</td>
</tr>
<tr>
<td>Background</td>
<td></td>
<td></td>
<td>2 = Physical Sciences</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 = Life Sciences/Medicine</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 = Finance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 = Accounting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6 = Marketing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7 = Management/Business Admin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8 = Personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9 = Operations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 = MIS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11 = Computer Science</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12 = Humanities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13 = Social Sciences</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14 = Legal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 = Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16 = None</td>
</tr>
<tr>
<td>Gender</td>
<td>Independent Variable</td>
<td>Dummy/Nominal</td>
<td>Blau’s Index: $1 - \sum p_i^2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scale</td>
<td>0 = Female</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 = Male</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Blau’s Index: $1 - \sum p_i^2$</td>
</tr>
<tr>
<td>Functional</td>
<td>Independent Variable</td>
<td>Nominal Scale</td>
<td>Blau’s Index: $1 - \sum p_i^2$</td>
</tr>
<tr>
<td>Background</td>
<td></td>
<td></td>
<td>1 - Zpi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of Active Partners Having Equity Interest in Venture</td>
</tr>
<tr>
<td>Team Size</td>
<td>Control Variable</td>
<td>Ordinal Scale</td>
<td>Number of Active Partners Having Equity Interest in Venture</td>
</tr>
</tbody>
</table>

*Age.* It was thought that some respondents may be sensitive about discussing their age in absolute number of years. Therefore, a decision was made to provide categories (spanning five years each) to measure age. For instance, the first category was 20-25
years; the second category was 26-30 years, and so forth (see Table 14). The last category, ninth, measured age above 61 years.

**Education.** In order to measure educational level, respondents were asked to check every educational level achieved, and identify their major or field of study. High school was measured as 12 years, some college as 13 years, Associate degree as 14 years, Bachelor's degree as 16 years, a Master's degrees as 18 years, and finally, a doctorate degree as 22 years.

**Educational Major.** The educational specialization represented by the highest obtained university degree was used to determine educational background. Individuals were classified into the following fifteen categories (a large number of categories was used to capture as much heterogeneity as possible in the teams studied): engineering, physical sciences, life sciences/medicine, finance, accounting, marketing, management/business administration, personnel, operations, MIS, computer science, humanities, social sciences, legal, and other. If a respondent did not have any college degree, he/she was classified as having no educational specialization. This approach was adopted by Wiersema and Bantel (1992) in their study that examines the relationship between top management team demography and corporate strategic change.

**Gender.** Respondents were also asked to provide information on their gender. A male was coded as one and a female as zero.

**Functional Background.** Functional background was measured by the area in which the person had the most experience (e.g., see Bantel, 1993; Bantel & Jackson, 1989). Again, a large number of categories were provided (eleven), and the respondents
were asked to choose the category in which they had the most experience. These categories were: finance, accounting, MIS, marketing, management/business administration, personnel, operations, engineering, legal, medicine, and other.

**Team Size.** Finally, venture team size was measured as the total number of active partners having an equity interest in the venture. Respondents were asked to mention the number of individuals who were active partners in their venture. Even though information was gathered on team size, it was decided not to study this variable as the data indicated almost no variation in team size. Of the 40 venture teams that participated in this study, 32 were two-member teams, whereas only seven were three-member teams, and only one team was a four-member team. This lack of variation in team size does not provide adequate information on which to base any results/findings.

The demographic trait scores were calculated by aggregating values for a team's members and calculating the mean. Homogeneity-heterogeneity has been measured in a number of ways (e.g., Allison, 1978; Blau, 1977; Taagepera & Ray, 1977; Teachman, 1980). Heterogeneity of the demographic variables was measured using Blau’s index (1977). Bantel and Jackson (1989) indicate that Blau's index has been found to be very highly correlated with alternative indices of heterogeneity. It is calculated as:

\[ I - \sum p_i^2 \]

where \( p \) is the proportion or percent of group members in a category, and \( i \) is the number of different categories represented in the team (for instance, in a team with no heterogeneity on a given variable, the index will have a value of zero. The index has a theoretical high of one, indicating maximum heterogeneity).
Independent variable with their appropriate measures were discussed in this section. Next is detailed the dependent variable measure.

**Team Interpersonal Process Effectiveness (TIPE)**

An important step in reestablishing the validity and reliability of a measure is to conduct a confirmatory factor analysis when the sample has changed (Nunnally, 1978). Factor loadings may change as samples change, even though the samples may be derived from the same population. A confirmatory factor analysis is thus performed on the Watson et al. (1995) TIPE instrument.

The reliability of measures was established using Cronbach’s alphas using Number Cruncher Statistical System (NCSS) (Hintze, 1992, 1995). The analysis produced Cronbach’s alphas of 0.96 (Leadership), 0.97 (Interpersonal Flexibility), 0.88 (Team Commitment), and 0.85 (Helpfulness). The values of alpha satisfy the guideline provided by Nunnally (1978) for acceptable reliability level of 0.70 or higher.

Once data were gathered, a confirmatory factor analysis was run to categorize the dependent variable. As a first step in obtaining factor solutions, an unrotated principal components analysis was conducted. Almost all items loaded on one factor. This factor explained 78.7 percent of the total variation, and had an eigenvalue of 11.81. The other eigenvalues were less than one (Hintze, 1995). Further, the examination of scree test indicated the presence of one factor. The results of the factor analysis are presented in Table 15.
TABLE 15. Factor Loadings of Team Interpersonal Process Effectiveness

<table>
<thead>
<tr>
<th>Items</th>
<th>Unrotated Factor</th>
<th>Rotated Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.888</td>
<td>0.879</td>
</tr>
<tr>
<td>2</td>
<td>0.947</td>
<td>0.945</td>
</tr>
<tr>
<td>3</td>
<td>0.904</td>
<td>0.898</td>
</tr>
<tr>
<td>4</td>
<td>0.854</td>
<td>0.841</td>
</tr>
<tr>
<td>5</td>
<td>0.841</td>
<td>0.827</td>
</tr>
<tr>
<td>6</td>
<td>0.853</td>
<td>0.841</td>
</tr>
<tr>
<td>7</td>
<td>0.890</td>
<td>0.883</td>
</tr>
<tr>
<td>8</td>
<td>0.925</td>
<td>0.922</td>
</tr>
<tr>
<td>9</td>
<td>0.927</td>
<td>0.924</td>
</tr>
<tr>
<td>10</td>
<td>0.919</td>
<td>0.915</td>
</tr>
<tr>
<td>11</td>
<td>0.881</td>
<td>0.872</td>
</tr>
<tr>
<td>12</td>
<td>0.924</td>
<td>0.920</td>
</tr>
<tr>
<td>13</td>
<td>0.916</td>
<td>0.911</td>
</tr>
<tr>
<td>14</td>
<td>0.825</td>
<td>0.809</td>
</tr>
<tr>
<td>15</td>
<td>0.802</td>
<td>0.784</td>
</tr>
</tbody>
</table>

Eigenvalues

<table>
<thead>
<tr>
<th>Percentage</th>
<th>11.81</th>
<th>11.60</th>
</tr>
</thead>
<tbody>
<tr>
<td>of variance</td>
<td>78.73</td>
<td>98.93</td>
</tr>
</tbody>
</table>

1. Sets goals effectively
2. Continually improves
3. Efficient at problem solving
4. Sets high quality standards
5. Demonstrates effective leadership functions
6. Helps coordinate team effort among members
7. Openly shares information about tasks
8. Demonstrates flexibility with members
9. Resolves conflict with members
10. Individual style aids team problem solving
11. Contributes significantly to team
12. Friendly and cooperative with members
13. Focuses on common team goals
14. Helps members beyond what was required
15. Enthusiasm for team performance
Although the results of unrotated principal components analysis indicate the presence of only one factor, a rotated factor analysis was performed. This extracted factor explains 78.73 percent of the variation in the construct.

Generally, rotation is desirable because it helps achieve simpler and theoretically more meaningful factor solutions (Hair, Anderson, Tatham & Black, 1995). In addition, it also helps in producing comparable results from different methods of factor extraction (Comrey & Lee, 1992). The factor loadings were rotated using Varimax rotation technique.

The results of factor analysis confirmed the unidimensionality of team interpersonal process effectiveness. The results, however, did not confirm the multidimensionality of team effectiveness.

After rotation, and an examination of eigenvalues and scree test, one factor emerged, which accounts for almost 99 percent of the total variance. Cronbach’s alpha was obtained using the fifteen items for the effectiveness grid, which produced an overall alpha level of 0.98. This discrepancy in the number of factors in the present study may stem from the relatively small sample size and different sample characteristics (for example, the Watson et al. study used over 190 venture dyads). Furthermore, the current study is limited to only one industry.

A factor analysis is a test to see whether the identified factors correspond with the proposed theory given a particular sample. Furthermore, the factor analysis provides only a partial support for the assessment of internal consistency, and the factors identified previously; it, by no means, provides conclusive evidence (Comrey & Lee, 1992).
Interpretations based on results of factor analysis should be confirmed with theoretical evidence, as well as with evidence outside the factor analysis itself (Hair, et al., 1995; Comrey & Lee, 1992). The results of this analysis, must only be considered tentative.

**Data Analysis**

In this study, team level of analysis (Campion et al., 1993) is used even though some information is collected at the individual level. In essence, each team is a subject, with varying number of members.

To analyze the data, descriptive statistics are used. Means, standard deviations, and correlations among the variables are presented. Descriptive statistics are generated for age, education, educational background, functional background, gender, and team interpersonal process effectiveness. In addition, the assumptions of regression analysis are also discussed.

The results of the confirmatory factor analysis reveal one factor to define the dependent variable in this sample. Almost all items load on this factor, which explains 78.73 percent of the total variation. Research (Carmines & Zeller, 1979; Hair, Anderson, Tatham, and Grablewski, 1979) indicates that it is appropriate to use a composite (total) score where the first factor explains a large proportion (40 percent or more) of the total variance, and where most of the items load substantially on the first component. It is, therefore, deemed appropriate to use a total score as a measure of team interpersonal process effectiveness (TIPE) for this study.
The primary analysis used in this study is regression. Cohen and Cohen (1983) state that one of the most popular tools for extracting information from data is regression. There are certain assumptions of the model that need to be considered. These include: implied linear relationship between the variables, normality, and homoscedasticity (Kvanli, Guynes, and Pavur, 1989). Cohen and Cohen (1983) state that inferences that can be drawn about the nature of the population increase substantially if attention is paid to these assumptions. Given this fact, this study pays close attention to these assumptions while using regression analysis.

In summary, descriptive statistics, factor analysis, and correlation analysis are presented. Then regression analysis is performed to test the hypotheses.

**Chapter Summary**

The research design and methods that are employed to test the hypotheses developed in Chapter II are presented in this chapter. A field study is used with the target population of computer related venture firms in a large midwest city in the U.S. The firms and subjects are identified through the Chambers of Commerce, peer referrals, and library research. Survey interviews are conducted in order to collect data.

An instrument designed by Watson et al. (1995), named Team Interpersonal Process Effectiveness Grid (TIPE), is used to measure team interpersonal process effectiveness. In addition, demographic information are also collected from the
respondents. The data is analyzed using regression analysis. These results are detailed in Chapter IV.
CHAPTER IV

ANALYSIS OF RESULTS

In this chapter, the results of the data analyses used to test the hypotheses are presented. First, data characteristics are presented. This section includes descriptive statistics for the variables used in the study, assumptions of regression, and a correlation matrix of independent variables. In the section following that, results of the hypotheses tested are presented. The chapter concludes with the results of a post-hoc power analysis. A comprehensive discussion of the results is presented in Chapter V.

Data Characteristics

In this section descriptive statistics and the assumptions of regression analysis are presented. Descriptive statistics are provided for all the independent and dependent variables used in this study. Then the regression model assumptions, which include linearity, normality, and homoscedasticity are examined. Next, the sample is examined for outliers. Finally, individual variables tested for correlation.

Descriptive statistics are summarized in a tabular form for the variables used in this study. There are 40 cases with no missing data. Table 16 provides information on minimum and maximum values of data, mean (average), standard deviation, and data type.
The statistics are calculated using Number Cruncher Statistical System (NCSS) (Hintze, 1992, 1995).

TABLE 16. Descriptive Statistics for the Variables Used in Research Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVGAGE</td>
<td>25.25</td>
<td>55.50</td>
<td>41.73</td>
<td>8.96</td>
<td>Cont.</td>
</tr>
<tr>
<td>AGEHET</td>
<td>0.00</td>
<td>0.67</td>
<td>0.35</td>
<td>0.25</td>
<td>Disc.</td>
</tr>
<tr>
<td>AVGEDU</td>
<td>12.67</td>
<td>22.00</td>
<td>16.30</td>
<td>2.29</td>
<td>Cont.</td>
</tr>
<tr>
<td>EMHET</td>
<td>0.00</td>
<td>0.67</td>
<td>0.34</td>
<td>0.26</td>
<td>Disc.</td>
</tr>
<tr>
<td>SEXHET</td>
<td>0.00</td>
<td>0.50</td>
<td>0.23</td>
<td>0.25</td>
<td>Disc.</td>
</tr>
<tr>
<td>FBHET</td>
<td>0.00</td>
<td>0.67</td>
<td>0.35</td>
<td>0.25</td>
<td>Disc.</td>
</tr>
<tr>
<td>TIPE</td>
<td>36.00</td>
<td>179.25</td>
<td>79.73</td>
<td>36.40</td>
<td>Cont.</td>
</tr>
</tbody>
</table>

N = 40
Missing Data = 0

AVGAGE = Average Age
AGEHET = Age Heterogeneity
AVGEDU = Average Level of Education
EMHET = Educational Major Heterogeneity
SEXHET = Gender Heterogeneity
FBHET = Functional Background Heterogeneity
TIPE = Team Score

Average age, with a mean of nearly 42, and a standard deviation of 9 years, is the most variable of the independent measures. Overall, the group is quite highly educated, with a mean of over 16 years of education, which means slightly above Bachelor’s degree.

Age heterogeneity has a mean of 0.35, which means that the average heterogeneity observed is 0.35 on Blau’s index. Similarly, educational major heterogeneity, gender heterogeneity, and functional background heterogeneity have means of 0.34, 0.23, and 0.35, respectively.
The dependent variable, i.e., total team score (TIPE), shows the aggregated average score of the team. The dispersion is wide, at about 36 as a standard deviation from the mean of 80; that gives a healthy range for analysis of the research problems.

Inferences drawn about the nature of the population can increase substantially if attention is paid to the assumptions of regression analysis (Cohen & Cohen, 1983; Kvanli et al., 1989). These assumptions include an implied linear relationship between the variables, normality, and homoscedasticity of the errors.

Univariate Normality Tests are run for the variables using NCSS, and display information about skewness (z-value, probability); kurtosis (z-value, probability); and omnibus-\(k^2\) (probability). Skewness measures the symmetry of a distribution, whereas kurtosis measures the flatness or peakedness of a distribution. The omnibus test is a combination of skewness and kurtosis into one normality test (Hintze, 1995). If the value of skewness is less than -1, or is greater than +1, the distribution is considered to be significantly skewed (Hair, et al, 1995). The results of univariate normality test are presented in Table 17.

The results indicate that Team Interpersonal Process Effectiveness Score and Average Education are significantly right skewed. The skewed data suggest the potential existence of outliers and nonlinear effects. A test for outliers is performed for each single variable, as well as for each regression model used in the study to identify the existence of any outliers. \(T^2\) test is performed (alpha value = 0.01) to detect outliers. A close examination reveals that there are none present in the study. Natural logarithm transformations are performed to bring the data into greater linearity.
### TABLE 17. Univariate Normality Tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>Skew</th>
<th>z</th>
<th>Prob</th>
<th>Kurt</th>
<th>z</th>
<th>Prob</th>
<th>Om-K^2</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVGAGE</td>
<td>-0.03</td>
<td>-0.08</td>
<td>0.939</td>
<td>1.83</td>
<td>-2.73</td>
<td>0.006*</td>
<td>7.48</td>
<td>0.024</td>
</tr>
<tr>
<td>AGEHET</td>
<td>-0.56</td>
<td>-1.58</td>
<td>0.115</td>
<td>1.61</td>
<td>-4.19</td>
<td>0.000*</td>
<td>20.08</td>
<td>0.000*</td>
</tr>
<tr>
<td>AVGEDU</td>
<td>0.99</td>
<td>2.59</td>
<td>0.010*</td>
<td>3.70</td>
<td>1.32</td>
<td>0.187</td>
<td>8.44</td>
<td>0.015</td>
</tr>
<tr>
<td>EMHET</td>
<td>-0.48</td>
<td>-1.36</td>
<td>0.175</td>
<td>1.47</td>
<td>-5.62</td>
<td>0.000*</td>
<td>33.38</td>
<td>0.000*</td>
</tr>
<tr>
<td>SEXHET</td>
<td>0.12</td>
<td>0.36</td>
<td>0.722</td>
<td>1.04</td>
<td>43.68</td>
<td>0.000*</td>
<td>1908.30</td>
<td>0.000*</td>
</tr>
<tr>
<td>FBHET</td>
<td>-0.56</td>
<td>-1.58</td>
<td>0.115</td>
<td>1.61</td>
<td>-4.19</td>
<td>0.000*</td>
<td>20.08</td>
<td>0.000*</td>
</tr>
<tr>
<td>TIPE</td>
<td>1.44</td>
<td>3.44</td>
<td>0.001*</td>
<td>4.39</td>
<td>1.91</td>
<td>0.056</td>
<td>15.48</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

* indicates significance at p < 0.01

AVGAGE = Average Age
AVGEDU = Average Level of Education
AGEHET = Age Heterogeneity
SEXHET = Gender Heterogeneity
FBHET = Functional Background Heterogeneity
TIPE = Total Team Score

Individual variables are tested for correlation. The findings are presented in a correlation matrix in Table 18.

### TABLE 18. Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>AVGAGE</th>
<th>AGEHET</th>
<th>AVGEDU</th>
<th>EMHET</th>
<th>SEXHET</th>
<th>FBHET</th>
<th>TIPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVGAGE</td>
<td>1.00000</td>
<td>0.00000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGEHET</td>
<td>0.10206</td>
<td>1.00000</td>
<td>0.5309</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVGEDU</td>
<td>-0.31802</td>
<td>0.25031</td>
<td>1.00000</td>
<td>0.0455*</td>
<td>0.1193</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>EMHET</td>
<td>-0.33318</td>
<td>0.08338</td>
<td>0.16479</td>
<td>1.00000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEXHET</td>
<td>-0.27695</td>
<td>0.07059</td>
<td>0.14605</td>
<td>-0.19375</td>
<td>1.00000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FBHET</td>
<td>-0.06688</td>
<td>-0.06290</td>
<td>-0.11246</td>
<td>0.37882</td>
<td>0.11166</td>
<td>1.00000</td>
<td></td>
</tr>
<tr>
<td>TIPE</td>
<td>-0.43411</td>
<td>-0.02535</td>
<td>0.31158</td>
<td>-0.12600</td>
<td>0.18380</td>
<td>-0.32479</td>
<td>1.00000</td>
</tr>
<tr>
<td></td>
<td>0.0051*</td>
<td>0.8766</td>
<td>0.0503*</td>
<td>0.4385</td>
<td>0.2562</td>
<td>0.0409*</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

The second set of numbers represents corresponding *p values*.

* indicates significant probability at 0.05

** indicates significant probability at 0.10
Significant at the 0.05 level are the relationships between average age and average level of education, average age and educational major heterogeneity, and functional background and educational major heterogeneity. Also significant at the 0.05 level are the relationships between independent variables of average age, average education, functional background heterogeneity and the dependent total team score. Finally, marginally significant at the 0.10 level is average age with gender heterogeneity.

Regression Analysis

The primary analysis used in this study to test the hypotheses is regression analysis. Five hypothesized relationships are proposed in the present study and tested using regression analysis. Six independent variables used are: average age (AVGAGE), age heterogeneity (AGEHET), average level of education (AVGEDU), educational background heterogeneity (EMHET), gender heterogeneity (SEXHET), and functional background heterogeneity (FBHET). The dependent variable is team interpersonal process effectiveness (TIPE). The results of regression analysis are presented in Table 19. The values of beta coefficients ($b$), coefficient of determination ($r^2$), correlation coefficient ($r$), and test statistic ($t$) for the model with their corresponding probability for the significance ($p$ values) are presented.
TABLE 19. Relationship between TIPE and Independent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>$b$</th>
<th>$r^2$</th>
<th>$r$</th>
<th>$t$ value</th>
<th>$p$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVG AGE</td>
<td>-1.94</td>
<td>0.188</td>
<td>-0.434</td>
<td>-2.971</td>
<td>0.0026</td>
</tr>
<tr>
<td>AGE HET</td>
<td>-4.06</td>
<td>0.001</td>
<td>-0.025</td>
<td>-0.156</td>
<td>0.4383</td>
</tr>
<tr>
<td>AVG EDU</td>
<td>0.93</td>
<td>0.097</td>
<td>0.312</td>
<td>2.021</td>
<td>0.0251</td>
</tr>
<tr>
<td>EM HET</td>
<td>-0.19</td>
<td>0.016</td>
<td>-0.126</td>
<td>-0.783</td>
<td>0.7808</td>
</tr>
<tr>
<td>SEX HET</td>
<td>0.30</td>
<td>0.034</td>
<td>0.184</td>
<td>1.153</td>
<td>0.1281</td>
</tr>
<tr>
<td>FB HET</td>
<td>-0.52</td>
<td>0.105</td>
<td>-0.325</td>
<td>-2.117</td>
<td>0.9796</td>
</tr>
</tbody>
</table>

Hypothesis 1

The first hypothesis states that there is an inverse relationship between average age and team interpersonal process effectiveness. The results of regression analysis indicate that a significantly negative relationship exists between the two variables ($p < 0.05$). It needs to be noted that a lower total team score is indicative of decreased team interpersonal process effectiveness. As is evident from Table 19, as average age in a venture team increases, the team interpersonal process effectiveness score decreases as well. This finding supports the first hypothesis. According to the results, almost 19 percent of the variation in TIPE is explained by average age ($r^2 = 0.188$). According to the regression model, a one unit increase in average age is associated with a 1.94 unit decrease in TIPE score, which corresponds to an increase in team effectiveness. A $t$ value
of -2.971 along with a corresponding \( p \) value of 0.0026 indicates that there is a significant inverse relationship between average age and TIPE, thus supporting the first hypothesis.

**Hypothesis 2**

According to hypothesis two, an increase in age heterogeneity is expected to result in a decrease in TIPE. A nonsignificant relationship is found between the two variables using a significance level of 0.05. The \( p \) value reported is 0.4383. As can be seen, less than one percent \((r^2 = 0.001)\) of the variation in TIPE is explained by age heterogeneity. The results, thus, indicate that this hypothesis was not supported.

**Hypothesis 3**

The third hypothesis predicts that there is a positive relationship between the average level of education and team interpersonal process effectiveness. A regression analysis on the relationship produces a significant positive association. A significant \( p \) value (0.0251) indicates that the relationship is supported. This result means that as average level of education increases, the TIPE score increases. An increase in TIPE score indicates an increase (improvement) in team interpersonal process effectiveness. A positive relationship between the two variables signifies that an increase in the average level of education is associated with an increase in team interpersonal process effectiveness, thus supporting the third hypothesis. As can be seen from Table 19,
approximately 10 percent \((r^2 = 0.097)\) of the total variation in TIPE is explained by average level of education. A unit increase in average education corresponds with an increase of 0.93 units in TIPE score, which means an increase in team effectiveness of the same amount. The expected relationship is thus supported.

**Hypothesis 4**

In hypothesis 4 there is expected to be a positive relationship between educational major heterogeneity and team interpersonal process effectiveness. When TIPE is regressed on educational major heterogeneity, a nonsignificant relationship emerges \((p = 0.7808)\). The results showed that only about 1.6 percent of the total variation in TIPE is explained by educational major heterogeneity. Hypothesis four, therefore, is not supported.

**Hypothesis 5**

The next hypothesized relationship proposing a positive relation between gender heterogeneity and TIPE also produces nonsignificant results with a \(p\) value of 0.1281. Only about 3.4 percent of the total variation in TIPE is explained by gender heterogeneity. Analysis produces a beta value of 0.30, and \(r\) value of 0.184, with a probability value at a level exceeding 12 percent. The results of this regression model, therefore, does not support hypothesis five.
Hypothesis 6

Hypothesis six proposes a positive relationship between functional background heterogeneity and TIPE. The outcome of the regression procedure produces very insignificant results. The results indicate that the relationship between functional background heterogeneity and team interpersonal process effectiveness is in the direction opposite to the one that was hypothesized ($p = 0.9796$). As evidenced by Table 19, this regression procedure produces a correlation coefficient of -0.325, and a $b$ value of -0.52. Approximately 10.5 percent of the total variation in TIPE is explained by functional background heterogeneity. The results indicate that as functional background heterogeneity increases, TIPE score decreases, which indicates a decrease in team effectiveness. A discussion on this finding is presented in Chapter V. This finding does not support the proposed hypothesis.

Results of the regression tests on the hypotheses are presented in Table 20. The table shows both supported and unsupported hypotheses.

**TABLE 20. Summary of Tests of the Hypotheses**

<table>
<thead>
<tr>
<th>H#</th>
<th>Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>There is an inverse association between average age of the team members and team interpersonal process effectiveness.</td>
<td>$S^1$</td>
</tr>
<tr>
<td>H2</td>
<td>There is an inverse association between age heterogeneity of the team and team interpersonal process effectiveness</td>
<td>$NS^2$</td>
</tr>
</tbody>
</table>

Table 20 (continued)
TABLE 20 (Continued)

<table>
<thead>
<tr>
<th>H#</th>
<th>Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4</td>
<td>There is a positive association between heterogeneity of educational</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>backgrounds and team interpersonal process effectiveness</td>
<td></td>
</tr>
<tr>
<td>H5</td>
<td>There is a positive association between gender heterogeneity and team</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>interpersonal process effectiveness.</td>
<td></td>
</tr>
<tr>
<td>H6</td>
<td>There is a positive association between heterogeneity among team members</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>with respect to their previous functional experience and team interpersonal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>effectiveness.</td>
<td></td>
</tr>
</tbody>
</table>

1 S = Hypothesis supported
2 NS = Hypothesis not supported

Post Hoc Power Analysis

In keeping with Mazen et al’s (1987) suggestion to report both Type I and Type II errors, the statistical results of both significant and nonsignificant findings are reported. Further, the required sample size in order to achieve a power of 0.80 at alpha = 0.05 and 0.1 are also reported for cases where power found is below 0.80. The required sample size is calculated based on the effect size found for the variables as a result of regression analysis. The results are shown in Table 21.

A statistical power for the significant effect of average age is found to be 0.89 at alpha = 0.05, and 0.94 for alpha = 0.1. Similarly, for average education, the statistical power equaled 0.73 at alpha = 0.05, and 0.86 for alpha = 0.1. In these cases, the power found is higher or very close to the conventional power level of 0.80 (or 0.70 in the early stages of research) advocated by Cohen (1987). Functional background heterogeneity reveals a power of 0.67 at alpha = 0.05, and 0.80 for alpha = 0.1.
TABLE 21. Post Hoc Power Analysis*

<table>
<thead>
<tr>
<th>Indep Variables</th>
<th>Power 0.05</th>
<th>Required Sample Size for Power 0.80</th>
<th>Power 0.1</th>
<th>Required Sample Size for Power 0.80</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVG AGE</td>
<td>0.89</td>
<td></td>
<td>0.94</td>
<td>9000</td>
</tr>
<tr>
<td>AGE HET</td>
<td>0.06</td>
<td>10000</td>
<td>0.13</td>
<td>7000</td>
</tr>
<tr>
<td>AVG EDU</td>
<td>0.73</td>
<td>62</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>EM HET</td>
<td>0.19</td>
<td>390</td>
<td>0.31</td>
<td>280</td>
</tr>
<tr>
<td>SEX HET</td>
<td>0.30</td>
<td>180</td>
<td>0.44</td>
<td>130</td>
</tr>
<tr>
<td>FB HET</td>
<td>0.67</td>
<td>56</td>
<td>0.80</td>
<td></td>
</tr>
</tbody>
</table>

* The required sample size is calculated based on the effect size found for the variables as a result of regression analysis. The required sample size is not calculated for cases where the power is 0.80 or greater.

AVG AGE = Average age
AVG EDU = Average level of education
AGE HET = Age heterogeneity
SEX HET = Gender Heterogeneity
FB HET = Functional background heterogeneity

The nonsignificant relationship of age heterogeneity has a power of 0.06 (alpha = 0.05) and 0.13 (alpha = 0.1). In both the cases, very large sample sizes (10,000 at alpha = 0.05, and 7,000 at alpha = 0.1) are required to achieve a power level of 0.80. Similarly, the other nonsignificant variable, educational major heterogeneity, produces a power of 0.19 at alpha = 0.5, and 0.31 at alpha = 0.1. Here again, large samples of 390 (alpha = 0.05) and 280 (alpha = 0.1) are needed to produce the conventional power of 0.80. Lastly, for gender heterogeneity, a power level of 0.30 is observed at alpha = 0.05, and of 0.44 at alpha = 0.1. Sample sizes of 180 and 130 are required at alpha = 0.05 and 0.1, respectively, to achieve a power of 0.80.

The results of post-hoc power analysis substantiate the significant findings reported earlier. Interpretations of nonsignificant findings should be cautiously made in
light of a possibility of committing a Type II error. Less than 0.80 power level found in some of the cases is discussed in more detail in Chapter V.

Chapter Summary

The results of data analysis are presented in this chapter. After presenting descriptive statistics and discussing the assumptions of the regression model, a correlation matrix for all variables used in the study is presented. Results of each hypothesis tested are displayed.

Hypothesis one predicts an inverse relationship between average age and team interpersonal process effectiveness, and is significantly supported as predicted. Hypothesis two also predicts an inverse relationship between age heterogeneity and team interpersonal process effectiveness (TIPE), but is not supported.

Hypothesis three is supported and demonstrates a significant positive relationship between average level of education and TIPE. Hypothesis four proposes a positive association between educational major heterogeneity and TIPE, hypothesis four is not supported. Hypothesis five also predicts a positive relationship between gender heterogeneity and TIPE, hypothesis five is not supported. Hypothesis six proposes a positive relationship between functional background heterogeneity and TIPE. The findings indicate a relationship in the direction opposite to the one predicted.

Finally, a post-hoc power analysis is performed to determine the statistical power of both significant and nonsignificant results. Power analysis confirms the adequacy of
sample size for the significant findings, and supports the reduced risk of Type II error for the hypotheses that are supported for this research.
CHAPTER V

DISCUSSION

In Chapter V, a detailed discussion of the results of the hypotheses analyzed in Chapter IV is presented. This discussion is presented in light of the literature review and data analysis presented in the previous chapters. First, the findings of the hypotheses are discussed along with possible explanations regarding why some of the expected relationships were not found. In the second section validity of findings is discussed. Four types of validity are discussed: statistical conclusion validity, internal validity, construct validity, and external validity. Following this section, implications for both theorists and practitioners are presented. Finally, limitations and directions for future research are suggested in the last section.

Discussion Of Hypothesized Relationships

The discussion of hypothesized relationships is presented in two sub-sections. In the first sub-section results of hypotheses relating to demographic traits are discussed. Trait factors indicate the extent to which team members have certain demographic characteristics. In the second sub-section findings of hypotheses relating to demographic diversity are discussed. Demographic diversity refers to “the relative homogeneity or heterogeneity of a team on a characteristic” (Wiersema & Bantel, 1992: p. 95).
Demographic Traits Hypotheses

In this section the findings of hypotheses relating to two demographic traits examined in this study are discussed. These include average age and the average level of education of venture team members. Particularly convincing evidence emerged for the influence of these trait effects. Venture teams experiencing team interpersonal process effectiveness are characterized by member with lower average age, and higher level of education. These ventures are owned by members who are relatively young (average age about 42 years), and have above-average levels of education (16.3 years). A discussion on both these variables is presented in more detail in the following sections.

Average Age. The first hypothesis relating to average age proposed that there will be an inverse relationship between average age of the team members and team interpersonal process effectiveness (TIPE). The relationship between average age and TIPE was supported in the expected direction. The results of regression analysis indicate that as the average age of team members increases, there is a corresponding decrease in the team interpersonal process effectiveness scores. A decrease in the team interpersonal process effectiveness scores indicates a decrease in team interpersonal process effectiveness.

This finding is clearly in keeping with the literature which indicates that younger team members bring better cognitive resources to the team. These include sharper learning and reasoning capabilities, and higher flexibility. As people age, the ability to
integrate declines. Older workers tend to take longer to reach decisions, and are more resistant to the change especially necessary in small firms.

Relationship-oriented behavior attributes have been found to be higher among younger team members. Older team members require more training and skill development in team and interpersonal behaviors than younger members. Older workers grew up in systems which were more mechanistic, and which had much less expectation for group interaction than the younger workers. Thus, it is not surprising that venture teams which had younger members had lower TIPE scores, indicating higher team interpersonal process effectiveness. Hypothesis one was, therefore, supported.

Average Level of Education. The next demographic trait examined was the average level of education of venture team members. The hypothesis relating to level of education proposed that there will be a positive relationship between the average level of education and team interpersonal process effectiveness (TIPE). The average level of education was significantly related to team interpersonal process effectiveness in the expected direction. The results of regression analysis prove that there is a significantly positive relationship between the level of education and team interpersonal process effectiveness scores. An increase in score indicates an increase/improvement in team interpersonal process effectiveness.

The results of this hypothesis corroborate the literature in this field. This hypothesis was based on the premise that members with higher degrees are more likely to have training and experience in team environments. Besides, it has also been observed that high technology entrepreneurs have a higher level of education than other types of
entrepreneurs. Finally, it has also been suggested that higher levels of education enable members to handle more complex situations and coordinate decisions across people and units.

This hypothesis is, therefore, supported. According to the results, higher level of education among venture team members is likely to create higher levels of team interpersonal process effectiveness.

**Demographic Heterogeneity Hypotheses**

In this section the findings of hypotheses relating to heterogeneity of demographic variables are discussed. The heterogeneity variables studied include age heterogeneity, educational heterogeneity, gender heterogeneity, and functional background heterogeneity. No support for the heterogeneity argument emerged. A discussion on each of these factors follows.

**Age Heterogeneity.** The hypothesis relating to age heterogeneity stated that there will be an inverse relationship between age heterogeneity of the team and team interpersonal process effectiveness. Although in the expected direction, the results of regression analysis did not provide support for this hypothesis ($p = 0.4383$).

Some possible explanations can be examined for this nonsignificant finding. One possible explanation may be that some respondents feel that questions regarding demographic items (e.g., age, education, occupation, and income, especially age), are personal matters; others may feel offended, or defensive about them (Rossi, Wright &
Anderson, 1983). Some respondents may find it disconcerting to answer a question about their age. Although care was taken not to offend any respondent by providing age categories (instead of asking for their absolute age in number of years), the possibility that some respondents may have been uncomfortable answering a question about their age cannot be ruled out. There may be a possibility that the information provided by respondents may not be accurate and may reflect a socially desirable response. Such a situation may be problematic for the calculation and measurement of heterogeneity.

For the purpose of gathering and analyzing data, age was coded as 1 = age 20-25, 2 = age 26-30, 3 = 31-35, and so forth. This categorization of age may have reduced variability on this variable. The survey asked respondents to classify themselves into one of these age categories based on the assumption that people often feel more comfortable reporting age in this manner.

There are certain questions which lend themselves better to self-administered form of survey compared to face-to-face interviews. Some studies (e.g., Jonsson, 1957; Marks & Mauldin, 1950) indicate that self-administered questionnaires are better for items which may suffer from rounding errors (e.g., age and education). This study used face-to-face and telephone interviews to gather data. The form of data gathering may have contributed to the nonsignificant finding of this hypothesis.

Another possible explanation could be the possible lack of heterogeneity of age in this sample (the minimum age heterogeneity measured on Blau's index was 0.00, and the maximum was 0.67, with a standard deviation of 0.25). It may also be possible that the nature of this particular sample of venture teams does not lend itself to a measurement of
heterogeneity. Majority of the ventures (32) which participated in the study were two
member teams. Only a few (seven) were three member teams, with only one having four
team members. This lack of adequate variation in team size may partly be responsible for
the lack of significant results of this hypothesis.

*Educational Heterogeneity.* Another hypothesis studying demographic
heterogeneity relates to educational heterogeneity. The hypothesis proposed that there
will be a positive relationship between heterogeneity of educational backgrounds and team
interpersonal process effectiveness. No significant results were found for this relationship.
The findings of this analysis contradict the findings of the recent literature.

The results indicate that as educational major heterogeneity increases, team
interpersonal process effectiveness score decreases. A decrease in team scores indicates a
decrease in the team interpersonal process effectiveness. This finding can be examined in
light of a couple of reasons which may possibly be responsible for this nonsignificant
finding. For instance, as mentioned previously, information relating to education and
educational backgrounds may be considered by some respondents to be sensitive
information. This may prevent some of the respondents from reporting accurate
information. This issue, may partly be responsible for the nonsignificant finding.

It is also important to consider the fact that the sample may not have adequate
variation to capture all the nuances of educational heterogeneity. The minimum value of
educational heterogeneity observed on Blau's index was 0.00, and the maximum was 0.67,
with a standard deviation of 0.26. Majority of the respondents were split between
technical (31.5 percent) and business (23.6 percent) degrees, with a fairly large percentage
not having a specified major (22.3 percent). This fact may have played a role in the lack of the expected effect of educational background heterogeneity.

Furthermore, as mentioned earlier, the majority of venture teams studied comprised two venture partners. Only very few ventures were three and four member teams. This lack of variation in the sample size may also be partly responsible for the lack of significant results.

**Gender Heterogeneity.** The hypothesis pertaining to gender heterogeneity predicted that there would be a positive relationship between gender heterogeneity and team interpersonal process effectiveness. This argument was based on the premise that mixed-gender teams offer a combination of men's and women's interaction styles, which equips the team to be effective at tasks requiring both task and social activity. While in the hypothesized direction, there was no significant empirical evidence to support the hypothesis that as gender heterogeneity in a venture team increases, the team interpersonal process effectiveness also increases.

Two most likely explanations for this nonsignificant finding can be examined. One relates to the lack of heterogeneity available within the venture teams studied. As the literature alludes, there is still a significant gap between the numbers of men and women who enter the fields of science and technology. Additionally, women in computer-related industries have started much fewer businesses compared to men (Fischer, Reuber, & Dyke, 1993). As Teach, et al. (1985: p. 439) succinctly put it, "it is largely a man's world." In their 1985, 1986 studies on software venture teams, Teach et al. noted that
there were very few women entrepreneurs. The present study also reports similar findings. Only a small percentage of the total respondents were women (22.5 percent).

The heterogeneity of variables is calculated using Blau's index. This index varies from a low of zero (indicating no heterogeneity if all members are the same) to a theoretical high of one (representing maximum heterogeneity). For this study, the minimum value of gender heterogeneity measured in this manner was 0.00, and the maximum was 0.50, with a standard deviation of 0.23. The lack of significant effect of gender heterogeneity on team interpersonal process effectiveness could have been partly due to this lack of heterogeneity in the sample (nearly all male).

The second possible reason for the nonsignificant finding is the same as has been mentioned earlier for the lack of significant findings on age and educational background heterogeneity, i.e., the lack of variation in the size of venture teams. Of the 40 venture teams which participated in this study, 32 were two member teams, with seven having three members, and only one having four members. This small variation in the size of venture teams may not have permitted comparison of relative heterogeneity between teams.

*Functional Background Heterogeneity.* The hypothesis related to functional background heterogeneity predicted a positive relationship with team interpersonal process effectiveness. Each member in a team offers an orientation that, in part, has been derived from experience in some functional area (Hambrick & Mason, 1984). When such a variety of perspectives is available to a team, it enhances communication and group
discussion to reconcile diverse perspectives, thereby producing high quality decisions. Heterogeneity has also been shown to increase creativity, flexibility, and innovation.

This hypothesis was not supported by regression analysis. The relationship between functional background heterogeneity and team interpersonal process effectiveness curiously yielded a negative rather than a positive coefficient. Such a decrease in team interpersonal process effectiveness scores indicates a decrease in team effectiveness.

It may be that the variation in sample size was not enough to detect the true relationship between functional background heterogeneity and team interpersonal process effectiveness. The size of venture teams studied may have produced erroneous results. To reiterate, majority of the teams participating in this study were two member teams, with only a few having three and four venture owners. Also important to note is the small coefficient of determination obtained in this case ($r^2 = 0.105$). It is evident that only about 11 percent of the variation in team interpersonal process effectiveness can be explained by functional background heterogeneity. A sample of this nature may not permit generalizability of results beyond this particular sample. This limitation, as well as others are addressed in more detail in the following sections.

In summary, the lack of hypothesized findings on heterogeneity of demographic variables is surprising. Yet, this lack of findings is more due to the low variance on the variables studied and the data obtained, rather than to a lack of the expected effects. As has been reiterated several times earlier in this chapter, there was not enough variation in the size of the venture teams, with most teams having only two members. This difference may not have been enough for the expected effects to be significant.
Regardless of the unexpected results, the findings and possible interpretations of this study are interesting. Clearly, there is a need for additional research on the various effects of demographic heterogeneity factors on team interpersonal process effectiveness. More in-depth analysis should be conducted in this field, perhaps using case studies and experimental designs, to understand the phenomenon of demographics in venture teams. As Hambrick and Mason (1984: p. 204) so succinctly commented on the possibility of nonfindings in upper echelons research,

"None of these possible interpretations can be considered uninteresting. Thus it is argued that testing the upper echelons theory is a no-loss proposition for researchers. The contribution to organizational understanding will be positive whether the results are or not."

Validity Of Findings

As with all research, there are potential concerns regarding validity which need to be addressed. Four types of validity are identified by Cook and Campbell (1979). These include: (1) statistical conclusion validity, (2) internal validity, (3) construct validity, and (4) external validity. Each of these validities along with their definitions and threats to these validity types is discussed. The issues addressed are those relevant to this study, and to correlational research in general.
**Statistical Conclusion Validity**

According to Mitchell (1985), this type of validity refers to the notion of "instability," and is concerned with sources of random error. Major threats to this validity include low statistical power, violated assumptions of statistical tests, reliability of measures, and non-response bias. A discussion of these threats to statistical conclusion validity follows.

The first concern identified by Cook and Campbell (1979) is low statistical power. Chapters III and IV address the importance of sample size for adequate statistical power. An a priori and a post-hoc power analysis were conducted to ensure that nonsignificant findings are not due to low statistical power. For the nonsignificant findings related to age heterogeneity, educational background heterogeneity and gender heterogeneity, sample size requirements are calculated at alpha = 0.5 and alpha = 0.1. The analysis reveals that for age heterogeneity, a sample size of 10,000 (alpha = 0.5) and 7,000 venture teams (alpha = 0.1) would be needed for a power of 0.80. Similarly, educational background heterogeneity would require sample sizes of 390 teams (alpha = 0.5) and 280 teams (alpha = 0.1) for a power of 0.80. Likewise, gender heterogeneity would require 180 venture teams (alpha = 0.5) and 130 venture teams (alpha = 0.1) for a power of 0.80.

The sample sizes for variables which produced significant effects (power = 0.80 or more) is considered adequate. They all produced adequate power. Clearly, the sample size requirements for the nonsignificant variables are unrealistically large given the limited resources of time and money required for obtaining such large sample sizes. It seems that
the nonsignificant findings in this study are likely due to reasons other than an insufficient sample size. Thus, it seems logical to conclude that the sample size used in this study was sufficient to detect any significant effects in this research. Low statistical power, therefore, is not a potential threat to statistical conclusion validity in this study.

The second threat to statistical conclusion validity relates to violated assumptions of statistical tests. The assumptions of regression analysis include linear relationships between the variables, normality, and homoscedasticity of the errors. These assumptions were tested (see Chapter IV) and were shown to be adequate. None of the variables indicated a significant violation of these assumptions. Violated assumptions are, therefore, not a concern in establishing statistical conclusion validity in this research.

Reliability of measures is another concern identified by Cook and Campbell (1979). The reliability of measures is discussed in detail in Chapter III. Furthermore, this study adopts the approach advocated by Cook and Campbell (1979) to enhance statistical conclusion validity. The study uses aggregated units (instead of individuals), because a group mean is more stable than individual scores. The analysis of reliability issues in this study reveals that reliability is not a significant problem for this research (Cronbach's alpha greater than 0.70).

Yet another statistical conclusion validity threat, that of non-response, may be relevant for this study. Although all the identifiable computer related firms in the city targeted for research were contacted (86 firms), only 40 of those agreed to participate in the study. In undertaking research of this nature, it is very difficult to get a listing of all the firms to be included in the sample. No definitive updated single source is available to
identify all the firms. In spite of this limitation, a comprehensive attempt was made to identify all the relevant ventures. As mentioned previously, 40 of these firms participated. Curiously, majority of those firms (32) were two member venture teams, seven were three member teams, and only one had four venture partners. There was no way to adequately control for the firms agreeing/not agreeing to participate in this study. An equal opportunity and invitation was extended to all the 86 firms; only 40 of those agreed to participate. No conclusive, sure-shot method is known by which the respondents in this sample can be compared to the non-respondents. This may, thus, be a potential concern.

To some extent, however, this concern can be mitigated by comparing the characteristics of the respondents of this study with those of other studies. For instance, Teach et al. (1985, 1986) in their nationwide survey of the software venture teams report that entrepreneurs in this field are very well educated. In their sample, a very small percentage of respondents had less than a Bachelor's degree (14 percent). In the present study as well, the respondents had a high level of education (average slightly over 16 years).

Teach et al. (1985, 1986) also report that only a small percentage of the total principals studied were female (15 percent). The present study also found a small percentage of female venture owners (approximately 22 percent). Finally, in their analysis of the distribution of the number of venture team owners, Teach et al. (1985, 1986) report that a majority of the teams were two member teams (almost 39 percent), with approximately 15 percent each being three and four member teams. The present study also reports similar distribution of venture team owners.
Given these similarities in the sample characteristics, it may be argued that although no direct way of estimating non-response bias is available, that this sample may be fairly representative of the population targeted. It compares quite accurately with the nationwide findings reported by Teach et al. (1985, 1986). Nevertheless, given incomplete information about other samples, and the fact that some ventures did not participate in this study, it can not be determined with absolute confidence that the present sample is wholly representative of individuals and firms in the general population. This may, thus, be considered a potential concern.

**Internal Validity**

The main concern in correlational research relating to internal validity is that there may be a third, conceptually different variable which is the reason behind the significant correlation between the independent and dependent variables (Mitchell, 1985). It is important to address whether there is an alternative explanation (other than the hypothesized reasons) for the identified relationships in the study.

Chapter II dealt with a detailed analysis of the literature pertaining to the variables used in this study. Although the threat to internal validity can never be conclusively ruled out, a thorough review of literature helps eliminate the likelihood of a third variable in this study.
There are other threats to internal validity that need consideration. Those, however, are not pertinent to this study, and are, therefore, not addressed here. Internal validity is not considered to be a potential threat for this study.

**Construct Validity**

This type of validity measures the extent to which operationalized measures represent the construct of interest being studied (Mitchell, 1985). This is the validity that is concerned with "confounding" effects (Cook & Campbell, 1979). Mitchell (1985) presents some concerns about construct validity that need scrutiny in correlational research. One such concern is the "extent to which respondents represent the group from which they are sampled as well as whether the measures represent the construct" (Mitchell, 1985: p. 197). Related to this concern is the issue of content validity (e.g., see Kerlinger, 1986). Kerlinger (1986: p. 417) defines it as "representativeness or sampling adequacy of the content." There are no empirical tests to evaluate content validity. Content validation is essentially judgmental, carefully planned and carried out procedures ensure content validity. If those involved with the research and those in positions of responsibility agree on the measures and procedures used to conduct the study, it has content validity (Hoskisson, Hitt, Johnson, & Moesel, 1993).

This study uses Hambrick and Mason's (1984) classic study as a base, which advocates the study of "upper echelons" in evaluating organizational outcomes. Their study was based on a call from Pfeffer (1983) emphasizing the significance of examining
demographics in organizations. Hambrick (1994) reiterated the importance of studying the "dominant coalition" in understanding organizational outcomes in small to medium-sized firms (in comparison to this type of research which has focused mainly on large organizations in the past). Furthermore, this study uses an instrument designed by Watson et al. (1995) to measure team interpersonal process effectiveness. Reliability and validity of their instrument were established in their study on venture dyads. Considering the issues examined in this section, it is, therefore, argued that this study is based on sound theoretical grounds, and that the measures used in this study satisfy the conditions for ensuring content validity.

In order to further establish construct validity, Mitchell (1985) suggests addressing to what extent respondents differ from nonrespondents, and whether the sample is representative of the population. As discussed in the previous validity section, the comparisons between the characteristics of this sample and the characteristics of the samples in other studies indicate similar sampling frames. And although this concern cannot be unequivocally mitigated, it can be said with some level of confidence that the sample is representative of the general population.

Another concern discussed by Mitchell (1985) is that a third variable may be seen as conceptually similar (unlike internal validity where an unexpected, "spurious," and not conceptually similar third variable may be the reason for correlations found) and is equally likely to be responsible for the discovered relationships between the independent and dependent variables. A detailed and comprehensive review of the literature ameliorates
this concern and rules out the possibility of such "interchangeable" constructs. It is therefore, not a threat to this study.

Self-reports for gathering data are often used for collecting demographic information, and for soliciting respondents' perceptions on variables under study (Podsakoff & Organ, 1986). There are certain limitations associated with self-report data (Podsakoff & Organ, 1986) that need examination in the context of construct validity.

Demographic data gathered using self-reports are usually verifiable from secondary sources, and the benefits derived offset the potential problems which may arise from collecting such data (Gupta & Beehr, 1982; Podsakoff & Organ, 1986). This problem category, therefore, is not difficult to handle. The demographic data gathered for this study were mainly self-report, although some data were verified using secondary sources. Wherever possible, the demographic information provided by respondents were checked with published sources and through the personnel or human resource manager/department within the firm. No significant discrepancies emerged.

The other problem relates to data gathered based on perceptions or feelings of individuals. This category presents greater problems because there is no means of cross-validating such information (Podsakoff & Organ, 1986). The present study uses responses from all partners (multiple source) to measure team interpersonal process effectiveness. There are, however, certain concerns and limitations that this study has with respect to common method variance, because of the use of a single format to gather data. The limitations and concerns discussed here parallel those identified by Watson et al. (1995) in their study of team interpersonal process effectiveness in venture dyads. They mention
that their effort towards establishing construct validity was to define team interpersonal process effectiveness using qualitative methodology. Additionally, they content analyzed data from business teams to develop their definitions.

Identifying it as one of their limitations, Watson et al. (1995) note that the use of a single format is somewhat common in field research because of the difficulty of gathering data using multiple methods. This weakens the causal inferences that can be drawn from the results (Mitchell, 1985). This may be seen as a potential limitation for this study.

Mitchell (1985) suggests taking certain steps to minimize these potential concerns. He suggests citing previous studies that report the validity and reliability information on the measure used. This study does so in detail by examining and reporting reliability and validity information on the Watson et al. instrument (see Chapter III). Mitchell (1985) also suggests reporting response rates, which are often not mentioned in survey research (also see Podsakoff & Organ, 1986). This study reports a response rate of 46.5 percent, which is higher than in most field research studies.

Another suggestion to enhance validity is to gather data on independent and dependent variables at different times, or in different locations, or using different media (Mitchell, 1985; Podsakoff & Organ, 1986). Anything that changes the test or the test context would be helpful in reducing the problem of transient mood state, common stimulus cues and consistency motif. While gathering data for the present study, this suggestion was followed. In some instances, data on team interpersonal process effectiveness was gathered at a different time than when demographic information was
collected. In some cases, while some data were gathered in person, the remaining data were gathered using the telephone (e.g., demographic information).

Finally, Salancik & Pfeffer (1977) suggest reordering the questionnaire such that the dependent variable follows the independent variable. This suggestion, too, was followed while administering the questionnaire.

As can be seen, although this study presents some potential threats due to the use of self-report to gather data, steps were taken to minimize these concerns. And although concerns regarding construct validity cannot be totally ruled out with certainty (e.g., because of characteristics of the examiner, and halo and social desirability effects; see Fiske, 1982), this study makes an attempt to address as many concerns as possible to enhance construct validity.

**External Validity**

External validity deals with generalizing findings to or across times, settings, and persons (Cook & Campbell, 1979; Campbell & Stanley, 1963; Mitchell, 1985). There are two types of external validity: population validity and ecological validity (Neale & Liebert, 1986). Both these validities and the associated threats pertinent to this study are discussed.

Population validity refers to the extent that the findings of a study can be generalized to the target population (Neale & Liebert, 1986). There are two threats to
population validity that need consideration. These include: cost-restricted sampling and self-selection bias.

Cost-restricted sampling is often considered a constraint in field studies (Kerlinger, 1989). Limitations of time, money, and effort often play a part in making decisions about the sample size. In this study, although adequate to provide the statistical power needed, the sample consisted of 40 firms. Ideally, more venture teams could have been sampled but for the limitation of resources stated above. Despite this, cost-restricted sampling is not considered a limitation, and is, therefore, not a threat to population validity.

The other threat relates to selection bias, and to determine whether the sample is representative of the population. This may be a potential concern for this study. As mentioned previously, in undertaking a study of this nature, it is not easy to generate a list of firms to be included in the sample. The firms were contacted based on a review of published sources, information available through the local Chambers of Commerce, and peer referrals. Published information available is sometimes outdated and/or inaccurate. It is, therefore, not possible to determine with absolute certainty that the sample used for this study is representative of the population in the city identified for this research. This, however, needs to be examined in light of the fact that the sample for this study compares well with the nationwide samples used in other studies. More on this argument is presented in ecological validity section, which follows next.

The other type of external validity is ecological validity. It refers to how well the findings generalize to the contextual factors, such as time and place (Neale & Liebert, 1986).
This study was a one-time data collection study. Therefore, data gathered during this one time may not be generalizable to other times. This issue, which Neale and Liebert (1986) call temporal validity, may be a concern for this study in that the findings are time-bound.

The other concern relating to ecological validity is generalizability across geographic regions. The sample for this study was obtained only from a large midwest city in the United States, which may be considered an argument for restricted generalizability across geographical regions. It needs to be noted, however, that the sample for this study compares favorably to other nationwide samples. It is, therefore, argued that generalizability across geographic regions, although not a concern for this study, needs to be interpreted with caution. No attempt is made in this study to generalize across regions. Perhaps more longitudinal research conducted in different geographic regions would validate the findings of this study better. In summary, external validity of any given study can only be appraised through replication, and using different subjects, settings and times (Flanagan & Dipboye, 1980).

Implications Of The Study

The rudimentary purpose of this research undertaking was to add to the limited knowledge available on issues relating to venture teams in the present body of literature. More specifically, the purpose was to study the composition of venture teams and relate this to the team interpersonal process effectiveness, which has been shown to relate to the
success of ventures (e.g., see Watson et al., 1995). These objectives were accomplished through the examination of the relationship between demographic characteristics and team interpersonal process effectiveness in venture teams. Implications of the findings for theorists as well as practitioners are discussed in the following section.

**Implications for Theorists**

In the recent team and entrepreneurship literature, there has been a frequent call for more empirical research on teams (e.g., Kamm et al., 1990; Levine & Moreland, 1990; Watson et al., 1995) and defining team effectiveness. More specifically, there has been a call for more empirical and field research on team effectiveness and issues relating to forming and maintaining venture teams. By undertaking this research, several implications for theorists interested in teams literature are identified. First, this study follows Watson et al.'s (1995) definition of team effectiveness and examines team effectiveness in terms of interpersonal processes that take place between venture team partners. This approach of examining team effectiveness has value in that it develops a new measure for defining team effectiveness and examines how venture members operate as a unit. A grounded theory approach was used to systematically develop descriptions of characteristics that make up the phenomenon of team effectiveness (see Chapter III for more details). This way of defining team effectiveness in venture teams is unique and has not been undertaken in the past. This new way of evaluating team effectiveness definitely adds to the current body of knowledge and offers researchers an additional avenue through which to evaluate
effectiveness in venture teams. This will provide scholars in this field an additional base from which effectiveness in venture teams can be examined. As mentioned earlier, such research is sorely needed because the definition of what constitutes team interpersonal process effectiveness is still in a developmental stage.

The other major implication for theorists of this study lies in the fact that it answers the call for studying the "upper echelons" and "dominant coalition" in firms to better understand organizational outcomes. As stated in the literature, value lies in studying the demographic characteristics of top management. Although several studies have been undertaken to examine top management team characteristics, most of these studies have been conducted in large organizations. Hambrick (1994) recommends conducting this research in small to medium sized firms to enhance the prediction and explanatory power of findings. Despite the fact that small firms account for nearly 40 percent of the gross national product in the United States, very little is known about small business venture teams. This study attempts to examine the relationship between the demographics of venture team partners and team interpersonal process effectiveness in small business firms. This provides researchers a platform from which they can pursue further research relating to venture teams in small to medium sized businesses. The process of examining top management team demographic characteristics in small business ventures has been initiated in this research. The relationship between age and education and team interpersonal process effectiveness supports the theory that demographic characteristics do have a relationship with team effectiveness, which ultimately affects venture success. It is strongly suggested that this research be continued in further
understanding the meaning and implication of team effectiveness in ventures, and what role demographics play in determining team effectiveness. The fields of both entrepreneurship and organization theory and strategy will be augmented by more empirical research.

Implications for Practitioners

There are several implications of this study for practitioners (prospective and current entrepreneurs and venture team owners). Perhaps the most important implication is that findings of this research provide information and suggestions that would facilitate formation and maintenance of more effective venture teams.

Some of the findings of this study suggest that certain composition characteristics stand out as being related to team interpersonal process effectiveness (e.g., average age and average level of education). This illustrates the importance of paying attention to these factors while forming or re-forming venture teams.

The findings suggest that there is a negative association between average age and team interpersonal process effectiveness. Average level of education, on the other hand, has a positive association. A word of caution, however, is in order while interpreting these findings from a practitioner's standpoint. Selection of venture partner based on his/her age is problematic, practically and legally. The Age Discrimination in Employment Act of 1967 outlaws discrimination of individuals for employment purposes for those over 40 years of age. Additionally, the finding of a negative association between age and TYPE
is based simply on the sample used from the computer related industry in a midwest U.S. city. The results cannot be used at face value without examining the context which frames them. There is a large body of literature which cites the richness and usefulness of experience that older workers bring to a given situation (e.g., see Rhodes, 1983; Smith & Hoy, 1992; Taylor, 1975). The results, therefore, should be interpreted with caution, and should not be used without a relevant context.

Despite the fact that the heterogeneity factors did not prove to be significant as predicted, it should not mean that they are not important variables to be examined in a practical situation, and should, therefore, not be eliminated from further studies. Several reasons, other than the lack of expected effect, may have been responsible for the nonsignificant findings. Considerable more research needs to be done before conclusive inferences can be drawn about these variables.

Despite some nonsignificant findings, this study illustrates the potential importance of proper design of venture teams in influencing team interpersonal process effectiveness. The practicing venture team members should continue to examine all the demographic factors (trait and heterogeneity) to further explore the effect of these variables on team interpersonal process effectiveness.

**Limitations And Future Research Agenda**

This study, like all others, has some limitations which qualify the findings, and provide agenda for future research. A major limitation associated with this type of
research relates to establishing causality. A related limitation of this research is that it is a one time data collection study. Longitudinal studies using larger samples (constraints of time and money not withstanding) should be undertaken to identify causal relationships. Bantel & Jackson (1989) recommend undertaking case studies and field experiments to identify processes underlying causal relationships.

Regarding generalizability, it needs to be mentioned that this study awaits replication in different settings. Data should be collected from different geographic regions and should expand to incorporate other industries before the findings can be generalized. Furthermore, additional compositional demographic variables (e.g., race, ethnicity, team and firm tenure) should be included which would help better comprehend team interpersonal process effectiveness. Especially desirable would be a study where the sample has more heterogeneity than in the present sample. In a related vein, it needs to be mentioned that future studies should continue to examine and incorporate team size into their models for understanding team effectiveness. Team size was not controlled for in this study mainly due to the lack of variation of team size within the sample. As has been repeatedly emphasized in previous sections, majority of the teams were two-member teams, with very few having three and four members. The nature of the sample, therefore, precluded examining the effect of team size on team interpersonal process effectiveness. Future studies, however, should continue to emphasize team size in studying relationships between demographics and organizational outcomes.

Another limitation relates to the fact that the list of items describing team interpersonal process effectiveness is by no means exhaustive of all the variables that
constitute team effectiveness. An interdisciplinary approach should be adopted to analyze and assess the true relationships that exist between characteristics of venture team owners and team effectiveness. For instance, mental models from the psychology literature may be incorporated to better understand the processes involved. Furthermore, more than one measure for measuring team interpersonal process is needed to avoid common method variance concerns. Finally, more context-specific research is needed to understand the specific characteristics of team effectiveness in venture teams. Compared to what still awaits understanding in this field, the contribution of this study is only a drop in the ocean.

As always, there are some potential concerns associated with group level of analysis. Data were collected from individuals and then aggregated to the team level. Care must be taken not to compare team-level information with information at the individual level. Given the nature of this study, however, aggregation was deemed to be an appropriate procedure. Care was taken in calculating and interpreting team-level data. Future research might use team level of measurement. For instance, the evaluations that venture partners give each other may be provided as feedback to the other partners (Watson et al., 1995), and a consensus rating may be developed to assess team interpersonal process effectiveness in venture teams.

**Chapter Summary**

The discussion of findings is presented in this chapter. The discussion is divided into two categories: demographic trait hypotheses section, and demographic
heterogeneity hypotheses section. The trait variables proved to be significantly related to
team interpersonal process effectiveness; no support emerged for the heterogeneity
variables.

There are validity concerns associated with this research. In the second section,
four types of validity are addressed. These include statistical conclusion validity, internal
validity, construct validity, and external validity. For each type of validity, the threats
pertinent to the present study are discussed. Overall, it is believed that the areas of
concern do not pose any potential threat to the validity and reliability of this study.

Next, implications of the findings of this study for theorists and practitioners are
presented. Finally, limitations of the study are identified, and future research areas are
highlighted.

In summary, this study provides interesting information on the relationship
between demographics and team interpersonal process effectiveness. It is vital, however,
to keep in mind the unique characteristics that produce these results, suggesting that there
may be a possibility that the results may be different in different industries, time periods,
and geographical regions. As always, there are trade-offs attached to conducting research,
a dilemma associated with any study undertaken. As Dess, Newport, & Rasheed (1993: p.
786) assert, "researchers must recognize the 'postulate of commensurate complexity' (Thorngate, 1976), which posits that any theory of social behavior cannot simultaneously
achieve the goals of generalizability, accuracy, and simplicity." Despite this, the present
research provides encouraging results to continue further study of demographic variables
in venture teams. The limitations point to the need for refinement and enhancement of the
study. The findings suggest the potential value of examining and managing other potentially significant composition variables and characteristics which should be examined in future research. This study, which emphasizes the relationship between demographics and team interpersonal process effectiveness in venture teams, is intended to be a foundation for future theoretical and empirical research.
APPENDIX A

POWER ANALYSIS
Correlation Coefficient

LARGE EFFECT SIZE = 0.5

Numeric Report

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### Correlation Coefficient

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APPENDIX B

COVER LETTER
REQUEST FOR SURVEY INFORMATION

Dear Professional:

The Entrepreneurship Program & Small Business Institute at the University of North Texas requests your participation in a survey to determine the interactions of existing venture team partners in their group activities. You have been identified as a potential participant in this research project, which attempts to study team interpersonal process effectiveness in computer related businesses. Although participation is voluntary, your participation will make a most important contribution to the theory and practice of business venturing.

This research involves interviewing the venture team partners to gather information about the effectiveness of venture team group interactions. We operate under strict terms of non-disclosure, so you may be assured that any information on the survey form or otherwise given to us will be held in strict confidence.

The survey takes only a few minutes to complete. In addition to the survey instrument, some generic, demographic questions about the venture team members and the venture itself will be asked.

We will aggregate the findings into a Venture Team Partners Executive Summary containing findings and recommendations based on the survey information. Should you wish to attend a meeting to discuss the aggregated findings of the study, please indicate so on the bottom of the survey.

If you have any questions please do not hesitate to call Manju Ochani. She can be reached at (913) 345-2537. Thank you in advance for your participation, and best regards from the University of North Texas.

Louis D. Ponthieu, Director
Small Business Institute

Manju Ochani
Doctoral Candidate

This project has been reviewed and approved by the UNT Committee for the protection of human subjects (817) 565-3940.
DEMOGRAPHIC INFORMATION

Instructions: This information is for research purposes, and is strictly confidential. Although participation is voluntary, information provided by you will be highly appreciated. Please PRINT OR TYPE all information.

REMEMBER: An active Venture Team Partner is defined as an individual who has some financial ownership interest in the venture and is involved to some extent in the day-to-day operation of the business.

INFORMATION ABOUT THE BUSINESS VENTURE:

1. Business Name: ________________________________

2. Location(s): _________________________________

3. Industry Class (SIC): ________________

4. Principal Product(s)/Service(s): ________________

5. In what year was this venture started? _____

6. What is the total number of employees employed by this venture? _____

7. How many individuals are active partners in this venture? _____

8. How much were the approximate annual sales of this venture last year?
   ______ thousand/million dollars (please circle one)

9. How much do you project the approximate annual sales for this venture to be next year?
   ______ thousand/million dollars (please circle one)

10. Would you describe this venture to be a profitable venture?
    _____ (1)Yes _____ (2)No

11. Would you describe this venture to be a growing venture?
    _____ (1)Yes _____ (2)No

12. Are any of the active partners of this venture related to one another?
    _____ (1)Yes _____ (2)No

13. Do any of the active partners of this venture have prior joint experience in working together?
    _____ (1)Yes _____ (2)No
    Explain ________________________________________
### INFORMATION ABOUT YOU

14. Which of the following categories best describes your age?
   - 1. 20-25 years
   - 2. 26-30 years
   - 3. 31-35 years
   - 4. 36-40 years
   - 5. 41-45 years
   - 6. 46-50 years
   - 7. 51-55 years
   - 8. 56-60 years
   - 9. Above 61 years

15. Indicate your sex: (1) Male (2) Female

   - 1. American Indian or Alaskan Native
   - 2. White (Not Hispanic)
   - 3. Black (Not Hispanic)
   - 4. Asian or Pacific Islander
   - 5. Hispanic
   - 6. Other (please specify)

16. Please select the category below which you feel most closely identifies you:

17. Please check every educational level attained and give the degree field:

   1. High School [ ]
   2. Some College [ ]
   3. Associate Degree [ ]
   4. Bachelor’s Degree [ ] Major/Field
   5. Master’s Degree [ ] Major/Field
   6. Doctorate [ ] Major/Field

18. How much work experience have you had in your lifetime?
   ___ years

19. What was your position level in your previous job?

   1. Top Management [ ]
   2. Middle Management [ ]
   3. Staff [ ]
   4. Engineering/Scientist [ ]
   5. Clerical [ ]
   6. Faculty [ ]
   7. Student [ ]
   8. Technical Management (e.g., Team Leader, Project Manager) [ ]
   9. Other (please specify) [ ]
20. In which of the following functional backgrounds do you have the most experience? Please check only one.

1. Finance [ ]
2. Accounting [ ]
3. MIS [ ]
4. Marketing [ ]
5. Management [ ]
6. Personnel [ ]
7. Operations [ ]
8. Engineering [ ]
9. Legal [ ]
10. Medicine [ ]
11. Other (please specify) [ ]

21. Was your previous position in the hardware/software industry?
   (1)Yes (2)No

22. Prior to owning this venture, have you been the owner/partner of any other venture?
   (1)Yes (2)No

23. In your opinion, what are some of the characteristics of an effective venture team? Please explain.

   ____________________________________________

   ____________________________________________

24. Would you be interested in attending a meeting with other survey participants to discuss the aggregated findings of this study?
   (1)Yes (2)No

25. Please make any additional comments that you may think would be valuable for this study in the space provided below. Thank you very much for your participation.
**VENTURE TEAM PARTNER SURVEY (Confidential)**

*HERE'S HOW I WOULD EVALUATE MYSELF AND EACH OF MY VENTURE TEAM PARTNERS ON THE FOLLOWING FACTORS RELATIVE TO OUR GROUP INTERACTION...*

*A VENTURE TEAM PARTNER IS ONE WHO HAS AN OWNERSHIP INTEREST IN A DAILY INVOLVEMENT IN THE CURRENT VENTURE*

**EVALUATE EACH PARTNER ON EACH FACTOR BY ASSIGNING A 1-7 NUMERICAL EVALUATION FROM BELOW IN THE BLANKS AT RIGHT 1 = LEAST EFFECTIVE 7 = MOST EFFECTIVE**

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*WRITE THE NAME(S) OF YOUR VENTURE TEAM PARTNERS*
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