DIVERSITY OF MEMBER COMPOSITION AND TEAM LEARNING IN ORGANIZATIONS

by

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To

Regina Jules

Marie Rejouis

Cecile Rejouis
PREFACE

“Experience is the test, followed by the lesson.” – Arthur Freedman

Reflections from a Scientist-Practitioner…

Just as Kurt Lewin (1935) viewed behavior as a function of the person and their social context, my experiences to date have been shaped by the social environment I was in at that moment in time. Beginning with two of the best decisions I made in the last five years which led me to pursue my intellectual interests by attending the joint Masters program in Organization Development at The American University and NTL Institute and moving to Cleveland, OH to attend Case Western Reserve University’s doctoral program in Organizational Behavior.

My two years at The American University’s joint Masters program in Organization Development and my exposure to the diverse faculty and others in the NTL movement increasingly focused my attention on individual, group and organizational phenomena. In fact, it was at American where my interest in Gestalt applications to organizational consulting and change developed and my close friendship with Johnnie Smith led me to begin attending workshops offered by The Gestalt Institute of Cleveland. In the meantime, I also became quite interested in the Tavistock Tradition and attended a Group Relations conference. It was then I began to notice that theories of group life in the field of Organization Development were very fragmented. So the idea to write a paper that told stories about my experiences in each of these traditions arose in my first doctoral course at CASE, Group and Interpersonal Analysis.
I did not at the time realize the connection between my emerging philosophy of experiential and action learning, clinical inquiry and helping teams to solve their own problems combined with my exposure to the social identity and embedded intergroup theories. I found these theoretical perspectives to be absolutely fascinating and complementary. I found the clinical approach to organizational research to be one of the most stimulating research methods I had ever been exposed to. This fact is important in that it predisposed me toward my qualifying paper – an action research project at the CASE School of Medicine.

The team I coached was able to respond much better to move beyond conflict derived from surface level differences by focusing on psychological differences based on values and in this case, learning styles. The team clearly seemed to manage their conflicts better when I helped them to think about how each member grasps information and makes sense of their experience rather than to make recommendations to them. It was also very evident during these team coaching session that the team benefited a great deal from their learning style self-analysis and that their preference was present but implicit. By making each member’s learning style more explicit to the team-as-a-whole, they clarified for themselves much of the challenges and frustrations they had experienced up until that point. These observations led me to structure my qualifying work on team learning more in terms of a surface- and deep-level differences rather than a consulting project focused on coaching work teams. I found myself suddenly wanting to write about the struggle teams encounter in organizations in that I could see from my consulting experience how this team's experience had been changed as a result of moving beyond the stereotypes that social categorization processes trigger. Thus, my dissertation grew
directly out of my qualifying paper, and was reinforced by my experiences with this work team.

What is ultimately exciting about my experiences at CASE is that I was provided with an opportunity to integrate my scholarly and applied training through a balanced presentation of both the research and applied aspects of studying and intervening in work teams – both as a researcher academician as well as a practical scholar. This balance has enabled me to obtain a rich blend of accepting the scientist as well as the practitioner that exists within me.
ACKNOWLEDGEMENTS

“Treat people as if they were what they ought to be and you help them to become what they are capable of being.” – Johann Wolfgang von Goethe

The journey of pursuing higher dreams has been a challenging voyage, made possible only through the support of a number of people. First and foremost, I would like to thank the Grand Architect, the conductor who resides in me, for enabling me to square my actions in making this accomplishment possible. I would also like to thank my wife, Regina. Her unwavering faith in me allowed me to believe in myself. She is a constant source of strength, love and motivation.

There are also many faculty, staff and fellow doctoral students at the Weatherhead School of Management at Case Western Reserve University who impacted my doctoral experience. First, I would like to thank my committee members, David Kolb, Melvin Smith, Ron Fry and Jim Zull. Specifically, I would like to thank David Kolb for his patience and his devotion to the theory of experiential learning and learning styles. The idea for this dissertation could not have been possible without him or the other scholarly works presented within it. Since my first year in the program he has encouraged me, challenged me and helped me to realize my research potential. He has provided me with invaluable experiences and opportunities in both the research and the practice of experiential learning theory applied to organizational behavior. His openness in allowing me to work virtually coupled with his critical support made it possible for me to gain access to the Hay Group and the web-based version of the Kolb Learning Style Inventory.
I also cannot say enough about Melvin Smith. He deserves a special recognition for believing in me since that first day we met at the Ph.D. Project conference in November 2003.

From the moment I started applying to the Department of Organizational Behavior until now, he has never wavered in his support or his friendship. I owe a great deal of gratitude to him for championing my doctoral pursuits at CASE and for holding me to a standard of excellence and for offering counsel and support when doctoral hardships ensued. He gave me the clarity I needed to keep my research model simple and practical.

I also want to extend special thanks to the other members of my committee, Ron Fry and Jim Zull. From the beginning in August of 2004, Ron has provided me with the opportunity to deepen my understanding of groups and teams. His comments and feedback have always been insightful and thought provoking. Meanwhile, Jim Zull’s interests in my study followed by his comments and suggestions on my dissertation were invaluable. Together, their acts of commitment were expressed through their thoughts and insights throughout the process.

I would also like to thank members of the Organizational Behavior Department. Without the challenge and support of Sandy Piderit, Susan Case and Richard Boyatzis’s scholarly thinking and brilliance, I would not have been as challenged during my doctoral experience. Special thanks to Pat Petty, Department Administrator and saving grace for all she did in helping me navigate through the administrative challenges of meeting with faculty, teaching courses and adhering to Graduate Studies’ policies. All were very generous with their time, support and most of all, encouragement.

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Several Organizational Behavior Ph.D. students had an impact on my experience. First, I would like to thank them beginning with Ante Glavas, Ellen Van Oosten as well as Bauback Yeganeh – my AU/NTL compadre who was very instrumental in advocating for me as a prospective incoming student. Without their individual and collective presence, I would not have been successful in enduring my years living in Cleveland, OH. Additional Ph.D. students who have enriched my experience at CASE that I would like to thank: my OB family, Darren Good, Duncan Coombe, Linda Robson, Meredith Meyers, Simi Joy, Greer Jordan, Bibi Potts, Tim Ewing, Anita Howard and Mauricio Puerta.

My closest friends have been my anchors! Without their support, I could not have excelled. My heartfelt thanks to: Calvin Thompson and Kenrick David for helping me during economic hardships; my frat brothers Chuck Thomas, Devon Jones, Ed Abrams and Andre Hill – I hope my doctoral accomplishment embodies the true meaning of Achievement in Every Field of Human Endeavor. I also want to thank those individuals that have been part of my foundation in the field of Organization Development: Arthur Freedman, Johnnie Smith, Carl Jennings, Rad Wilson, Pat Battle, Brenda Jones, Lennox Joseph and Bob Kramer of the faculty at The American University/NTL (AU/NTL) MSOD Program, Class 46 of the AU/NTL MSOD Program and the graduates of BBI V of the Gestalt Institute of Cleveland. To those not mentioned, but whose names remain printed in my life – many thanks for encouraging me.

I would like to express my appreciation to my family. My mother, Marie has always been a believer in me. My grandmother, sisters, aunt, uncle, brother-in-law and nieces have provided me with a source of comfort when things got rough. Their unending
support, patience, encouragement and love were all essential anchors that enabled me to move towards the completion of my doctorate degree.

Lastly, the research conducted in this study could not have been possible without the on-going support of the participating organizations and its team members. They deserve recognition for their commitment and willingness to complete my surveys.
Diversity of Member Composition and Team Learning in Organizations

Abstract

by

CLAUDY JULES

While demographic characteristics such as age, race and gender evoke social categorization processes about diversity that may result in unfavorable team processes and outcomes, psychological characteristics such as learning style can evoke diversity of thought leading to enhanced team performance. To expand how we realize the potential of diversity, this dissertation uses responses from 33 organizational teams from 6 different industries to examine team diversity effects on the team learning process: defined as a cycle of idea creation, planning, decision-making, and implementation. The implications team learning has on outcomes related to member disagreements on how task accomplishment occurs and how well the team meets its goals and satisfies client needs are also investigated.

Using survey methods, this is the first research to empirically examine the impact of demographic diversity and learning style diversity in one study. Drawing on theory and research related to team demography, team and experiential learning, team conflict and performance; a model of the relationship between team member diversity and the team learning process and outcomes of conflict and performance are created to guide hypothesis generation.

The hypothesis that the diversity of member composition influences the team learning process is partially supported. Results suggest that learning style diversity is
significant and positively related to the team learning process and performance and to the item, "our team achieves its goals." Although, correlations between demographic diversity and the overall performance index are not significant, one item in the index, an occurrence of critical quality errors, is positive and significant. Results also reveal that the team learning process is positively associated with team performance and is higher when the team’s task is non-routine. This study further extends research linking process-related conflict and team performance. Learning style diversity is significantly correlated with the lack of process conflict. Lastly, the team learning process and lack of process conflict are significantly related to team performance.

Overall the results suggest that demographic diversity tends to produce moderate levels of process conflict and impede team performance while learning style diversity is strongly related to conflict management and performance. Implications for theory and practice are discussed.

**Keywords:**   
team learning; experiential learning; learning styles; embedded intergroup; social identity; team conflict; team effectiveness; social and organizational psychology
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CHAPTER 1: INTRODUCTION

Overview of the Study

Some social and organizational psychologists and management scholars believe diverse organizational teams can be a source for competitive advantage while others see diverse teams as a disruption to optimizing organization effectiveness. Like most things in organizations however, things just aren’t what they used to be. As organizations become more diverse and business pressures intensify the demands on organizational teams, the ability to manage a constantly changing workforce is more essential than ever before. Understanding how different social and psychological attributes impact people’s perceptions of themselves and others, and how they relate to one another matters to a degree that it never did in the past. These attributes affect team processes and outcomes.

To understand the nature of these attributes, this dissertation tests an input-process-output model using survey research in a field study to examine the effects of team diversity – both demographic diversity and learning style diversity – on the team learning process, process conflict and team performance.

In their review of the diversity literature, Williams & O’Reilly (1998) conclude that the positive aspects of team diversity, the compositional distribution of team members on any social or psychological attribute that potentially leads to the perception that team members differ from one another, are typically driven by how members process information, such as a diverse set of knowledge, skills, and abilities to solve complex problems. Meanwhile, the negative aspects of team diversity are driven by social categories, such as age, race, and gender. While considerable theoretical and empirical evidence has focused on both the social and psychological attributes associated with team
learning behavior (Gibson & Vermeulen, 2003; Lau & Murnighan, 2005), frequency of communication (Zenger & Lawrence, 1989), conflict (Jehn 1997; Jehn et al., 1999) and team performance (Harrison et al., 1998; 2001), less attention has been given to the examination of psychological attributes likely to influence how members learn by transforming their experience into usable knowledge, and its implications for team outcomes.

To address this gap in the literature, this study considers five primary questions:

1. **Research Question 1**: What is the relationship between team diversity and the team learning process?

2. **Research Question 2**: What is the relationship between team diversity and outcomes of performance and process conflict?

3. **Research Question 3**: To what extent does team tenure moderate the relationship between team diversity and the team learning process?

4. **Research Question 4**: Does the team learning process mediate the relationship between team diversity and outcomes of performance and process conflict?

5. **Research Question 5**: To what extent does team task moderate the relationship between the team learning process and team performance?

To answer these questions, this study examines the effects of two types of team diversity, demographic diversity (social categories such as age, race, and gender) and learning style diversity – a psychological attribute – and how these attributes influence team learning: the cycle of activities through which a team gains clarity about its purpose, establishes good working relationships, and obtains and processes knowledge that
provide opportunities for it to effectively accomplish its goals, adapt, and improve (Kolb, 1984; Edmondson, 1999; Gibson, 2001; Gibson & Vermeulen, 2003).

Drawing on the social psychological and management literature to understand the relationship between conflict, team composition and team process, Jehn’s (1997) conflict typology was considered. Jehn’s (1997) conflict typology provides a conceptual framework to explore three types of conflict – task, relationship and process – and their relationship to team performance. These three types of conflict are further defined. First, task conflict exists when team members disagree about the content of decisions and involves differences in ideas and opinions. Second, relationship conflict, characterized by interpersonal incompatibilities among members, exists when team members display animosity or annoyance towards one another. Lastly, process conflict exists when team members disagree about how the work is accomplished (e.g., disagreements about roles and responsibilities, assignment of duties or the allocation of resources). The focus of interest in this study is on process conflict.

Diversity of Member Composition

This study is built on a sound theory foundation and empirical research on the subject of team diversity. The study incorporates the work of a diverse group of scholars. Rooted in the disciplines of social and organizational psychology and management, their research illustrates the underlying mechanisms and methodological approaches used to understand and study how the demographic composition of a team can influence team processes and team outcomes.
The first theoretical base is embedded intergroup relations theory (Alderfer & Smith, 1982; Alderfer, 1987). Based on this theory, teams are embedded in a larger social structure and that members of these teams represent other social categories to which they belong even while carrying out team tasks. Hence, interpersonal interactions among team members can be re-conceptualized as intergroup transactions. Alderfer (1987) notes, “interactions between individuals, viewed from an intergroup perspective, reflects the condition of each participant’s group, the relationship of participants to their groups, and the relationship between groups represented by participants as well as their personalities in each ‘interpersonal’ relationship” (p.203).

The second theoretical base is the social identity perspective. Based on social identity theory and social categorization theory (Tajfel, 1978; Turner, 1987; Reynolds et al., 2003), people define and differentiate themselves along social categories on the basis of age, race, gender, or other attributes (Tajfel, 1978; Turner, 1987). Individuals strive to enhance their self-esteem to achieve a positive social identity, such that a positive or negative valence can be associated with an individual’s identification with a social category or group represented by a cognitive component (categorization of the self into a particular group membership) and an affective component (the positive or negative valence attached to that group membership).

Diversity of Member Composition and Team Learning

Team diversity refers to the distribution of personal attributes across members of an organizational work team. This reflects a perspective that is sometimes referred to as surface- and deep-level diversity (Harrison et al., 1998). Surface-level diversity reflects
differences that are more readily observable (e.g., race, gender). Deep-level diversity reflects differences that are less visible (e.g., personality, values). These perspectives are discussed in greater depth later in the dissertation.

The attributes of interest in this study are the demographic attributes of age, race, gender (surface-level diversity) as well as psychological attributes of learning style (deep-level diversity). The distinction between these two types of surface- and deep-level attributes is important because demographic attributes may not be as relevant to a team’s given task, but they shape members’ perceptions and behaviors (Pelled, 1996). In addition, people use demographic attributes for categorization processes, which can cause hostility, anxiety, and stereotyping (Tsui, Egan, & O'Reilly, 1992). Furthermore, the initial perceptions made by and about team members often signal the quality and type of the future relationships among team members which may (or may not) continue to persist as members interact with each other over time (Tsui, Xin, & Egan, 1995). These differences will impact a team member as the number and degree of differences on demographic attributes within the team increases. Thus, the degree to which members differ from each other in demographic attributes can have negative effects on the amount of learning that the team demonstrates.

On the other hand, psychological attributes such as learning style (Kolb, 1984) often dictate how one thinks about and undertakes tasks. In other words, how team members put their knowledge into action. Members who have a take action mentality will have a very different mindset than those who have an observing mentality, and will tend to approach tasks differently. This difference in learning style is likely to create an environment in which there may be potential disagreement in how to plan an actual task
and how team members should go about implementing a solution. Therefore, learning differences are more likely to bring about synergy since the focus of disagreement is the task, not the relationship or interaction between the members (Ancona, 1990).

To further their understanding of the compositional effects on the team learning process in organizational teams, we need theory that comprehends the social and psychological aspects of the individual alongside the group level processes that influence the capability of the team as a whole. This dissertation is a step toward the development of such a theory. Building on the existing literature (e.g., Harrison’s (1998) surface- and deep level diversity, Pelled’s (1996) “Black Box”) this study considers experiential learning theory (Kolb, 1984) as another theoretical base and learning style (Kolb, 1984) as another diversity variable for the study of diversity in teams.

**Significance of the Study**

This study benefits the field of organizational behavior in five ways. First, the results of this study expand the existing research on teams by examining demographic diversity and learning style at the group level instead of at the individual or dyadic levels. Second, this study is concerned with learning style as a deep-level diversity attribute. Third, this study examines the relationship between team learning and the team outcomes of process conflict and performance. Fourth, this study explores two types of moderating relationships within teams – team tenure and team task – and attempts to link them to team composition, team learning process and team outcomes. Finally, the study makes a practical contribution by providing practitioners interested in expanding their organizational interventions in social systems with a heightened awareness about how
they can access other sources of diversity that are likely to enhance team performance and reduce process-related conflict.

To conclude the discussion on the study’s significance, findings from the present study will be of interest to organizational researchers who study team composition, team learning, team performance and process conflict. Particularly, social and organizational psychologists and management scholars because it has two inter-related foci: the interface of social influence processes and the social behavior in organizational teams.

**Research Strategy and Focus**

The research design used quantitative (survey) methods. Using pre-existing team learning, conflict and performance scales as well as the Kolb Learning Style Inventory: an instrument used to assess the learning preferences of individuals based on the four learning modes described in the experiential learning cycle (Kolb, 1971, 1984, 1999a), the data collected examined the properties and compositional make-up of organizational teams and the degree to which they engage in learning-oriented behaviors. Both the research model and research design (described in Chapter 2 and Chapter 3, respectively) of the study build upon the results of an earlier project (Jules, 2006) in which I studied a medical community service team to assess the influence of learning style as a deep-level attribute during an organizational intervention.

**Structure of the Dissertation**

The remainder of this dissertation is organized into four chapters. In Chapter 2, I define the domain of organizational teams and team diversity research. In what follows, I
review the existing theory and recent developments in research on team diversity, focusing primarily on the compositional approach (Tsui & Gutek, 1999). The compositional approach examines the distributional characteristics of demographic attributes of a team to understand the social and psychological experiences of team members and team processes. Using this approach, team diversity is examined in terms of indices of variance of demographic attributes of work teams (Wagner et al., 1984; Jackson et al., 1991). The term *team diversity* will represent this approach.

Chapter 3 discusses the research site, design, and the measures used to operationalize the constructs in this study. Based on the demography literature, I discuss the statistical methods used for analyzing the collected biographical data and testing the proposed hypotheses. This is followed by a review of the psychometric properties to assess the adequacy of the measures.

Chapter 4 describes the results of the study. Chapter 5 presents a discussion of the results, limitations of the study and implications for future research. The dissertation concludes with final remarks, a reference list and appendices with Institutional Review Board (IRB) application documents.
CHAPTER 2: THEORY AND RESEARCH

“There is nothing as practical as a good theory” – Kurt Lewin (Marrow, 1969, p.128)

In this chapter, I introduce the model used in this study. Organized into an input-process-output model of member composition and team learning, shown later in Figure 1, it links variables related to member composition, team learning behavior, and performance. I begin by defining what I mean by an organizational team. Then I review the literature that forms the conceptual foundation for the model. To accomplish this, I review the most commonly used theories to explain the social psychology of how and why members of organizational teams separate themselves into different social groups. This section is supported by the relevant research on demographic diversity within organizations (e.g., communication, conflict, and performance). I then focus on a different type of diversity under investigation in this study that has been found to influence team performance: learning style. In this chapter, I also present the hypotheses to be tested relative to each of the specific mediating and moderating relationships indicated by the research model.

Diversity of Member Composition and Team Learning:
Implications for Process Conflict and Team Performance

The diversity of member composition in organizational teams has generated considerable interest because of its theoretical and practical importance in the study of task-focused teams in organizations. One facet of these compositional attributes reflects demographic and work-related diversity among individuals, making it a relevant area for
further understanding of inputs that affect team functioning, such as experimenting, admitting mistakes, seeking feedback (Edmondson, 1999), or reflective communication (Gibson, & Vermeulen, 2003), as well as outcomes of these and other team dynamics.

Team effectiveness research has traditionally followed the input-process-output (I-P-O) tradition (McGrath, 1984; Gladstein, 1984; Hackman, 1987; Shea & Guzzo, 1987; Sundstrom et al., 1990). These models that gave rise to hundreds of empirical studies – including the study of team diversity (Jackson & Ruderman, 1995; Pelled, 1996), team learning (Edmondson, 1999) and team conflict (Jehn 1995; 1997; Jehn et al. 1999) suggest that inputs, such as composition, structure, task, and organizational context, impact team processes and outcomes associated with team effectiveness. Processes related to improved effectiveness include behaviors focused on problem solving and decision-making and shared beliefs that create a climate for psychological safety (Edmondson, 1999). This dissertation seeks to enhance the team literature by considering how the nature and attributes of members’ impact the team learning process that are commensurate with Kolb’s (1984) experiential learning cycle.

Interest in the topic of team learning in the organizational behavior literature has grown steadily in recent years (e.g., Senge, 1990; Argote, 1999; Edmondson, 1999; 2002; Gibson & Vermeulen, 2003; Kayes et al., 2005; Lau & Murnighan, 2005). Following that tradition, this study applies an I-P-O perspective – a tradition, which is frequently attributed to McGrath (1984). The moderating (e.g., tenure) and mediating (e.g., team learning) processes that influence these effects on performance outcomes are presented in Figure 1.
The Organizational Context of Teams: Defining the Domain

Interest in organizational teams has been central to psychological and management research for over half a century. The Hawthorne studies were one of the first series of studies to highlight the importance of teams in organizations (Shea & Guzzo, 1987). Similarly, organizational practitioners have ventured to increase their understanding of factors affecting the development and performance of teams (Peters and Waterman, 1982; Katzenbach & Smith, 1993). As Peters and Waterman (1982) note, “small groups are, quite simply, the basic organizational building blocks of excellent companies” (p.126).

In most organizations today, the use of teams is a cornerstone for driving organization effectiveness. The realization that teams play a pivotal role in organizational
performance has led to a proliferation of team studies in research laboratories and organizational settings over the last four decades. During this time, there has been an increased attention paid to the development of comprehensive models of team effectiveness.

**Definition of an Organizational Team**

There are many ways to define the notion of team in an organizational setting. The one used in this dissertation comes from the work within the I-P-O tradition. According to this tradition (Alderfer, 1977; Gladstein, 1984; McGrath, 1984; Hackman, 1987; 1990; 2002; Sundstrom et al., 1990; Guzzo & Dickson, 1996; Cohen & Bailey, 1997), organizational teams have four main attributes. First, organizational teams have a shared purpose that provides direction for members in producing an outcome (e.g., product or service). Second, members of organizational teams have differentiated roles, and see themselves and are seen by others as an intact social entity embedded in an organization (e.g., business unit). Third, organizational teams require members to be interdependent in their tasks for which they have collective responsibility. Fourth, organizational teams manage their relationships across organizational boundaries.

Practitioners in their definition of teams follow similar suit. According to Katzenbach and Smith (1993), teams coordinate activities, plan strategies, cooperate, and require that members accept individual and collective accountability for their combined efforts. They assert, “a team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they
hold themselves mutually accountable” (p.45). In this study, I use the terms *team* and *organizational team* interchangeably.

**The Organizational Context of Team Learning: Defining the Domain**

In order to respond more flexibly and quickly to rapidly changing environments, organizations increasingly rely on teams (Mohrman et al., 1995). Organizational teams are viewed as open, social systems in which members must coordinate their work together to accomplish task and maintenance functions (Gladstein, 1984). Drawing from theories of team performance and experiential learning, the focus of this dissertation is on the team learning process (Edmondson, 1999; Gibson & Vermeulen, 2003; Kayes et al., 2005) that facilitates performance effectiveness.

The team learning process is comprised of a series of interdependent behavioral activities that have been found to be positively related to performance (Argote, 1999; Edmondson, 1999; Zellmer-Bruhn & Gibson, 2006). Key among these is generating ideas, effective planning and communication, making decisions, and taking action on the decisions made through implementation. Through such behavior, teams can detect and correct errors (Argyris & Schon, 1978) and improve the efficiency and the quality of their performance. Through trial-and-error and by avoiding repetitive mistakes, organizational teams can improve their performance effectiveness.

As noted, organizational teams can adapt and respond to a wider range of contextual demands in large part because of the team’s capacity to manage social relationships among members within the team and the team’s ability to effectively utilize the diverse array of knowledge, information, and perspectives (Ancona & Caldwell,
1998) that contribute directly to the team learning process (Gibson & Vermeulen, 2003; Foldy, 2004) as well as to team performance (Ancona & Caldwell, 1992). This is also due to a team’s ability to adapt and improve its team processes. Combined, these factors make understanding the effects of a team’s composition and the team learning process, and its implication for team performance increasingly important.

**Definition of Team Learning**

For more than a decade, the term, *team learning* has appeared often in organizational scholars’ discussions of organizations (Senge, 1990; Watkins & Marsick, 1993). The concept of team learning has prospered, in part, because of the increasing empirical support for its value in team performance (Edmondson, 1999; Druskat & Kayes, 2000; Gibson & Vermeulen, 2003), and consequently, for organization effectiveness. What are the values for the team learning process? On one hand, it can enable a team to achieve its goals (e.g., single-loop learning). On the other hand, the team learning process is different in that it can enable a team to learn from its experience of achieving a goal to improve their collective competence to confront future issues (e.g., double-loop learning). As this occurs, team members are able to learn about using their selves in effective ways to contribute to achieving goals and enhancing personal gratification and self-esteem.

Researchers who study this form of team behavior have made strides toward understanding its nature (Argote, 1999; Watkins & Marsick, 1993), components (Edmondson, 1999; Gibson & Vermeulen, 2003), and effects (Edmondson, 1999; Druskat & Kayes, 2000). Despite this concept’s popularity in organizational behavior, my review
of the literature featuring studies or discussions on the team learning process revealed no
standard definition. Druskat & Kayes (2000) define team learning as “members acquiring
and sharing unique knowledge and information and examining what is helping and hurting team performance” (p.332). Kayes et al. (2005) define team learning as the ability of individual team members to learn teamwork skills and the capability of the team as a whole to develop the executive consciousness necessary to self-organize and manage its work process (p.330). Team learning behavior, as defined by Edmondson (1999), are activities that reflect asking questions, attending to feedback, seeking information and feedback, discussing mistakes, conducting experiments, and monitoring results. Gibson & Vermeulen’s (2003) define team learning as a process of multiple, interdependent team actions characterized by experimentation, reflective communication, and knowledge codification. Consistent with how previous authors define team learning, this dissertation defines the team learning process as a process by which organizational teams gain clarity about purpose, develop good working relationships, and effectively accomplish their goals. It involves valuing individual differences and similarities, as members cycle through a four-phase cycle of idea creation, planning, decision-making, and implementation.

The team learning process can be best understood by using the experiential learning model. As such, the categorization of the team learning process does not offer “new” learning behavior per se, but rather, a more comprehensive view that builds on and integrates previous work by using existing constructs that are conceptually linked to the Kolb’s (1984) learning cycle and fit the definition of the team learning process – process through which teams gain clarity of purpose, develop good working relationships and
effectively accomplish their goals – proposed in this dissertation. It is, by no means, an attempt to create an exhaustive list of learning behavior. Instead, my intent is to develop a categorization system that is broad enough to apply to different types of teams yet specific enough to provide value in either research communities or fields of practice. The following section explains in some detail the meanings of these different aspects that comprise the team learning process.

**Idea Creation:** Building on members’ different points of view and understanding different positions on issues can support a team in leveraging its full capability (Walton, 1998). As such, the team learning process requires members to facilitate the creation of ideas (e.g., brainstorming which encourages divergent thinking by team members). What do organizational teams generate ideas or gather information about? One example might be for a team to generate ideas to get a shared idea about the team’s purpose. This requires a two-phase process: first, divergent thinking and second, convergent thinking. Another is in achieving alignment between individual goals in which team members search and/or identify shared themes for potential improvements to accomplish its work. What’s involved in the development and use of ideas will vary depending on the contextual task-demands. As such, this dimension of learning is required as a starting point to seek background information and sense opportunities, investigate new patterns, or recognize discrepancies and problems.

**Planning:** Clarifying assignments and testing assumptions can enable a team to obtain a better understanding of a particular idea or proposal (Nadler & Spencer, 1998).
Given this, the team learning process involves effective planning among team members, which often involves creating a container for effective communication or reflective discussion. In this regard, a team can improve its conversational capability (Nadler & Spencer, 1998). Hence, the highest level of the team learning process implies the existence of free-flowing information and feedback among members. This activity requires members to probe and exchange information, and organizes their ideas through a process of reflective conversation for effective planning. When team members in the process of idea creation recognize effective performance hinges on their ability to exchange information from one team member to other team members, they will be more inclined to provide input and feedback to and accept it from one another about their performance. As such, teams will be more likely to act on that feedback and adapt their processes.

**Decision-making:** Delayed decision-making or counterproductive debates about which course of action, and which organizational data is “right” can result in severe team and organizational costs (Nadler & Spencer, 1998). However, if information is shared, stored, and retrieved adequately, teams can enable themselves to select and process information to be used as knowledge to reach decisions – a notion that is key to the team learning process. Hence, knowledge must be translated into concrete, generalized concepts, or action items through a process of decision-making. To decide means through which ideas are generated to solve problems and the explicit discussions about these ideas are translated into knowledge so that a workable outcome can be developed, agreed to, and subsequently, implemented. Once members have identified alternative courses of
action, choosing among them will often require the integration of differing perspectives and opinions of team members. The more capable a team is in doing this, the more likely they will be to take action and monitor the results of their implementation to increase their performance.

**Implementation**: One of the most common challenges to an organizational team is a lack of follow-through (Walton, 1998). This lack of taking action can undermine trust and team effectiveness, preventing teams from accomplishing their work (Walton, 1998; Edmondson, 1999). Hence, the team learning process requires the willingness, preparedness, and capability to follow through and monitor implemented solutions. A team’s implementation of decisions made and the monitoring of those actions are key to the team learning process. This process is perhaps at the very heart of team learning, for it makes the team truly an open social system, operating as more than the sum of its parts. In other words, team members must show ability not only in their own problem solving and decision-making processes, but also in the areas of executing their tasks and asking questions or discussing errors to course correct (Edmondson, 1999).

This categorization of the team learning process benefits the field of organization studies because of its complementary nature depicting a problem solving and decision-making process. For instance, in the field of Organization Development (OD), Edgar Schein’s (1969) model – a very well and accepted model of the stages of problem solving – supports the view of the team learning process described in this dissertation. According to Schein (1969), a team begins with a felt need – a particular problem within the team is identified – and proceeds in a collaborative effort at problem definition based on
brainstorming, generating ideas or goal setting. This is followed by the creation of possible proposals for solving the problem defined. Schein (1969) suggests that this stage is accomplished most effectively when no single proposal is evaluated until all proposals that members wish to consider have been shared and understood. Once all proposals have been put forth, the next step is to evaluate the relative merits of these proposal in terms of their feasibility and consequences of attempting to implement them. Once decisions based on consensus, for example, are established and understood, acting on the proposed solution follows.

Similarly, Guzzo (1995) posits that team members exchange information to identify and solve problems. These exchanges result in discussions of ideas to create and adopt the best possible solution to a problem that invariably, contributes to team effectiveness (Guzzo, 1995). As Guzzo (1995) notes, “these activities are interconnected to include gathering, interpreting, and exchanging information; creating and identifying alternative courses of action; choosing among alternatives by integrating the often-differing perspectives and opinion of members; and implementing a choice and monitoring its consequences” (p.4). To this end, basic support for the overall conceptualization of the team learning process exists through the work of Schein (1969), Guzzo (1995), and Ponds (1965; as cited by Kolb, 1976 and described later in this dissertation).

Understanding Team Conflict

A number of researchers have investigated the relationship between the demographic diversity and process conflict. Demographic characteristics that have been
the focus of some of these researchers’ studies include ethnic background, age, gender, experience and education (e.g., O’Reilly, Williams, & Barsade, 1998; Jehn, Northcraft, & Neale, 1999). These studies show that demographic diversity, in general, increases relationship and task conflict, although the effects vary across diversity variables and samples. For example, Pelled et al. (1999) found that race diversity had a negative effect on relationship conflict, but no effect on task conflict. In contrast, Pelled (1996) found—contrary to her expectations— that race dissimilarity had no effect on relationship conflict.

Given the discussion above, team conflict is common in organizations of all kinds. Relationship, task and process conflict form the foundation of Jehn’s (1997) model of team conflict and performance. Ambiguity and disagreements about roles and responsibilities are frequent sources of process conflict (Jehn, 1997). Drawing from Jehn’s (1997) typology of task, relationship and process conflict, the present study examines process conflict as a team outcome within organizational teams. This dissertation expands previous conflict research by examining the relationship between the team learning process and process conflict at the team level.

**Member Composition: Understanding Team Diversity**

Previous research has been conducted on how the composition of organizational teams influences team behavior and effectiveness (Gibson & Vermeulen, 2003). As Gibson & Vermeulen (2003) note, “the majority of this research has focused on the diversity between members on demographic attributes such as age, race, gender, team tenure, and functional area” (p.202). Most recently, Gibson and Vermeulen (2003)
demonstrated the importance of subgroups as a stimulus for the team learning process.

Diversity of member composition is conceptualized in terms of the relative proportions of members whose attributes comprise: (1) demographic diversity as a surface-level attribute characterizing features that are typically immutable in nature; and (2) learning style diversity as a deep-level attribute characterizing the cognitive processes members use to grasp, organize, interpret, and transform their experience into knowledge, that is used to learn (Kolb, 1984).

According to Harrison et al. (1998), surface-level diversity is defined as differences among team members in overt, demographic attributes that are typically reflected in physical features. According to researchers in social psychology (Tajfel, 1978; Turner, 1987) and organizational behavior (Alderfer, 1987, O’Reilly, Caldwell, & Barnett, 1989, Harrison et al., 1998, Jehn et al., 1999, Tsui & Gutek, 1999), individuals use physical features to form social perceptions and interpret behavior. These features are usually reflected in observable differences established at birth, and are used to categorize and differentiate individuals from others, and to interpret behavior. Surface-level diversity typically includes age, race, and gender and are akin to what other researchers have labeled as “social category diversity” (Jehn et al., 1999), “demographic” (Williams & O’Reilly, 1998), “visible” (Pelled, 1996), “readily detectable” (Milliken & Martins, 1996), “ascribed” (Tsui & Gutek, 1999), or “identity groups” (Alderfer, 1987).

On the other hand, deep-level diversity (Harrison et al., 1998) is defined as members’ psychological (Jackson & Ruderman, 1995) or underlying (Milliken & Martins, 1996) attributes. These attributes include differences among members’ personalities, abilities, beliefs, values, attitudes (Tziner & Eden, 1985; Jackson &
Ruderman, 1995; Jackson et al., 1995, Jehn et al., 1997; Barrick et al., 1998; Harrison, et al., 1998; 2002), and learning styles (Kolb, 1984) that are reflected in stylistic patterns of behavior. Among these are verbal and nonverbal modes of communication and the way in which people exchange personal information (Harrison et al., 2002) with other persons. Deep level diversity can be uncovered only after the members of a team know each other well after working together and interacting for an extended period of time. For the purposes of this dissertation, I distinguish between surface-level diversity as teams that are diverse or heterogeneous across demographic attributes of age, race, and gender. In contrast, deep-level diversity represents teams that are diverse or heterogeneous across learning styles.

**Theoretical Basis for Demographic Diversity:**

**Implications for the Team Learning Process**

As noted earlier, demographic diversity refers to the degree to which a team is heterogeneous with respect to demographic attributes. Demographic diversity in a team may lead members to stereotype each other, thereby evoking or provoking emotional conflict (Pelld et al., 1999) within an organizational team. That is, members may have interpersonal clashes that are characterized by anger, frustration, and other negative feelings (Jehn, 1994; Eisenhardt et al., 1997; Pelld et al., 1999). The following section describes two key theoretical bases – embedded intergroup relations theory (Alderfer & Smith, 1982; Alderfer, 1987) and the social identity perspective – that provide the rationale for explaining the influence of these social dynamics on the team learning process, and its implication for team performance.
*Embedded Intergroup Relations Theory*. Embedded intergroup theory goes beyond treating the team as merely the sum of its individual members by explicitly considering the team as a whole unit. By considering the team as a whole unit, members are not only seen as individual people, but also as representatives of their social group whenever dealing with individuals of other social groups. Just as individual members are embedded simultaneously in the social structure of subgroups, the team as a whole is nested within an organizational context, which in turn, is embedded in a societal context (Alderfer, 1987).

In organizational teams, member interaction based on identity groups (e.g., social categories or demographic attributes such as age, race, and gender) are shaped by status and power differentials (Alderfer & Smith, 1982; Alderfer, 1987). These status differences are reflected in the distribution of identity groups across hierarchical levels within the team and the overall organization, and can mirror that in society at large. That is, high-status group memberships in society may also occupy higher levels in a team, reinforcing status differences between majority and minority groups and influence interactions between these groups (e.g., in Western countries, men tend to have more power than women, Whites generally have more resources than people of color, and so on). While embedded intergroup theory helps organizational researchers and practitioners understand how external conflicts between groups in the larger society may be replicated in organizations, the social identity perspective, discussed in the next section, helps explain the human tendency to separate into different social categories and for those social categories to compete with each other.
The Social Identity Perspective. Supporting the arguments based on embedded intergroup theory is the social identity perspective – which encompasses social identity theory and social categorization theory. This perspective provides a theoretical base for explaining the cognitive processes through which members of a team form a self-concept that can influence the cognitive and affective processes associated with the team learning process.

The social identity perspective states that an individual’s self-definition is determined, in part, by “those aspects of an individual’s self-image that derive from the social categories to which he perceives himself as belonging” (Tajfel & Turner, 1986; p.16). According to the social identity perspective, team members tend to categorize themselves and others into social categories on the basis of how individuals perceive themselves and others in the social setting individuals find themselves operating. This categorization is based on overt demographic attributes, including age, race, and gender (Tajfel & Turner, 1979; Ashforth & Mael, 1989). Once categorization occurs, members develop positive opinions of their own social category and negative opinions of other social categories (Tajfel, 1978; Turner, 1982).

The social identity perspective further explains how the in-group and out-group dynamics based on members who categorize themselves and other team members may lead to potential negative consequences. For instance, members who perceive their own social category as superior tend to engage (subconsciously or unconsciously) in stereotyping, distancing, and belittling (Nadler & Spencer, 1998) members of other social categories (Tajfel, 1982). Members of other social categories, in turn, resent such negative treatment resulting in negative and counterproductive interactions and feelings.
within a team. As demographic diversity within a team increases, members generally will interact with those similar to themselves (e.g., social categories). When members of an organizational team differ across demographic attributes, they may have dissimilar belief systems (Wiersema & Bantel, 1992), consequently provoking in-group and out-group dynamics (e.g. subgroups).

**Demographic Diversity, the Team Learning Process and Process-Oriented Conflict**

The team learning process is driven by interpersonal perceptions, communication, and coordination between members within a team. However, previous studies have shown that emotional conflict (Jehn, 1994; 1995; Jehn & Shah, 1997) is more likely to be motivated by demographic attributes than psychological attributes. For instance, interpersonal disagreements based on demographic differences occur because categorizing team members in this way draws attention to features of a member which may be irrelevant to the team’s task at hand (Jehn & Shah, 1997). An example of this is referring to someone's age when discussing a task-related issue. Some members may feel uncomfortable with this. This kind of reference may also create resentment among team members, causing dissatisfaction among members and decreasing the amount of individual effort put into engaging in learning behavior and completing the team’s task adequately. Hence, members will not feel comfortable working in teams where feelings of dissatisfaction with the team’s experience exist.

Other implications of demographic diversity on the team learning process can be found in teams where there is a proportional majority of members based on age, race, or gender. As a result, perception may sometimes manifest itself as a perception of power –
the relative dependencies between people for valued resources (Emerson, 1962; Depret & Fiske, 1993). Here, the more dominant members will tend to talk more and have more influence on team processes, such as problem solving and decision-making. This in turn may reinforce (consciously or unconsciously) their dominance in their conversational styles, decision-making processes, or social interaction causing others in a team to make attribution errors (Nadler & Spencer, 1998). For example, in a predominantly homogeneous team, two team members of a numerical minority group may identify and interact with each other because their numerical scarcity draws their attention to each other (Joshi, 2006). Another example of how power differences can unfold and affect the team learning process is found in a case study that Edmondson (2002) described where two different behaviors hindered the team’s ability to learn. One member was seen as “boss” who took on the role of making final decisions. In contrast, another member was seen as the “facilitator” who encouraged input and consensus (Edmondson, 2002; p.139). Consequently, these incompatible roles led these members to develop negative attributions about each other’s motives.

The additional body of literature on theories of team decision-making focus on members’ need to use information fully and effectively to reach high quality decisions (Edwards, 1954) or to consider how teams attend to, encode, store, retrieve, and process information (Gibson, 2001) as an important part of team performance. This phenomenon can be exacerbated by what Wittenbaum et al. (1999) have termed collective information sampling (CIS). For example, information exchange in teams can often focus on information that is known and shared by all team members before the interaction, rather than information that is uniquely held by individual experts (Wittenbaum & Stasser,
Thus, while diverse teams may have the initial resources to solve problems effectively and reach creative solutions, poor team decisions may be explained, in part, by team members’ propensity to introduce and consider commonly held information at the expense of exchanging and considering information uniquely possessed by dominant members (Stasser & Stewart, 1992; Stasser et al., 1989).

As Edmondson (2002) noted in her study, power differences were either absent or actively mitigated in teams engaged in high levels of learning. Therefore, power differences, whether perceived or actual, can contribute to a lack of psychological safety – a shared belief held by members that the team is safe for interpersonal risk-taking and an antecedent to the team learning process (Edmondson, 1999) – causing non-dominant members to withdraw and fall silent, or by communicating largely with other members of their subgroup (Konrad, 2003; Foldy, 2004). Consequently, members will most likely feel less safe and less trusting and will experience miscommunication that diminishes a team’s ability to achieve a broad sense of psychological safety (Edmondson, 1999), inhibiting the team learning process and subsequently, team performance.

**Hypothesis 1**: Demographic diversity is negatively associated with the team learning process.

Social categorization theory (Turner, 1987) suggests that team members who are demographically similar are more likely to engage in “in-group” behavior and perceive others as having similar beliefs and attitudes than team members who are demographically different. For example, members of demographically diverse teams are likely to differ to a greater extent in their interpretations of the team’s goals and/or the
divergent ideas for an adequate approach to implement strategy than members of demographically homogeneous groups. Contrary to this, other researchers have argued that task conflict has positive effects on team outcomes. The positive outcomes result from enabling team members to see contrasting perspectives of an issue, to surface and question assumptions, and to promote innovative and creative thinking (Amason & Schweiger, 1994; Coser, 1956; Deutsch, 1969; Tjosvold, 1991).

Furthermore, homogeneous organizational teams in terms of age, race and gender are hypothesized to report less conflict as compared to heterogeneous organizational teams. For these reasons, demographically diverse teams are likely to experience more interpersonal incompatibilities and disagreements about their tasks and team processes than demographically homogeneous teams. Despite previous research that views conflict as a mediating or intervening variable (Ancona & Caldwell, 1992; Jehn, 1994; Jehn et al., 1999, Pelled et al., 1999), this dissertation examines conflict as an outcome variable.

Organization studies have a tradition of specifying the contingency under which certain performance outcomes hold or not. However, studies of the team learning process have rarely paid attention to how and when team learning within teams will be associated with outcomes that go beyond just performance. In fact, previous research tends to view various forms of conflict as a process and performance as an output. Yet, one can argue that the degree to which members establish a healthy working relationship encompasses one of Hackman’s (1987; 2002) as it pertains to establishing good team relationships. Hence, The team effectiveness literature’s lack of distinction between and conflict suggests that researchers have paid little if any attention to conflict as an indicator of a team’s successful performance. To illustrate this point further, the behavioral integration
by which team members cannot organize themselves in mutual and collective agreements on how tasks will be accomplished may be an indicator of the quality of the team’s future exchanges. Indeed, a team that can demonstrate collective interactions that enables them to learn will result in lower levels of process conflict. With the absence of process conflict, the team will in turn develop a greater capacity to operate as a high-performing team during future projects.

Hypothesis 2: Demographic diversity is positively associated with process conflict.

Team effectiveness is defined both broadly to include performance, attitudinal, and behavioral indicators (Hackman, 1987; Cohen, 1994) and narrowly to include the reproduction of designated products or services per specification (Shea & Guzzo, 1987, p.329). Hackman (1987; 2002) proposes a multidimensional approach to assessing team effectiveness. He argues that effective teams are those best able to satisfy three criteria: “A team product or service acceptable to clients; growth in team capability; and a team experience meaningful and satisfying for members” (p.30). This dissertation focuses on the Hackman’s performance dimensions. That is, the degree to which a team meets its agreed upon goals, satisfies external clients’ needs, and how well it fulfills the team’s mission (Hackman, 1987; 2002; Guzzo & Shea, 1992).

Given the above definition, the effects of demographic diversity on team performance reveal mixed results. Researchers have argued that conflict has a differential impact on team effectiveness in terms of attitudinal and performance outcomes. Some studies (Bantel & Jackson, 1989; Hambrick et al. 1996) reveal that demographic diversity
had a positive impact on team performance. Meanwhile, other studies (O’Reilly & Flatt, 1989) found demographic diversity to have a negative impact on team performance. Despite the mixed results, the literature yields more evidence to suggest that demographic diversity is negatively associated with team performance. To illustrate this point further, I consider three key points.

First, while demographic diversity yields different types of consequences, the empirical evidence is not conclusive. In other words, the increase of demographic diversity within the team does not automatically translate into enhanced team performance. This is especially true when the team lacks the effective practices to leverage other forms of diversity (e.g., cognitive or informational diversity that can lead to healthy debates of task conflict) that are more relevant to a team’s task as compared to team process. Second, with respect to psychological effects of diversity, studies by Ancona and Caldwell (1992) and Glick et. Al (1993) found that diversity increased cognitive resources, such as differences in viewpoints, ideas and opinions. These resources, however, did not translate into higher levels of team performance. Lastly, further evidence suggests that demographic diversity increased affective conflict – that is, the amount of interpersonal incompatibilities such as tension, animosity and annoyance among members within a team (Jehn et al., 1999; Pelled et al., 1999) – which in turn, was negatively associated with team performance.

**Hypothesis 3:** Demographic diversity is negatively associated with team performance.
Theoretical Basis for Learning Style Diversity: Implication for the Team Learning Process

The team learning process is a social process that involves the interactions of others in a team context. When individual members join an organizational team, they bring with them their learning preferences that influence and shape their perception, how they behave, and what they pay most attention to on a team task. Thus, it seems pertinent to expand and further our understanding of the effects of team composition on the team learning process by exploring cognitive differences through which learning occurs.

Experiential learning theory (ELT) informs our understanding of how and why members of a team acquire, store, transform, and use information in different manners; how they combine the felt qualities of their immediate experience with their existing knowledge base; and why member behavior may result in different valences towards thinking, feeling, observing, and doing. Kolb (1984) defines ELT as a process by which knowledge is created through the transformation of experience.
Figure 2 is a representation of Kolb’s experiential learning model and illustrates how members of a team can learn through experience, reflection, conceptualization, and experimentation. Figure 2 also provides a typology of learning styles – defined as preferences for grasping reality in order to transform experience into new knowledge. The four basic learning styles – diverging, assimilating, converging, and accommodating each characterize a particular pair of the four phases (concrete experience, reflective observation, abstract conceptualization, and active experimentation) in the experiential learning cycle.

The four basic learning styles are based on both research on an instrument created to assess individual learning styles, the Learning Style Inventory (LSI, Kolb, 1999a, 1999b) and clinical observation of LSI score patterns (Kolb, 1984, 1999a, 1999b). Learning styles characterize a difficult type of difference to identify in unfamiliar others
because they relate to deep-rooted social psychological characteristics. Kolb (1984) writes,

Learning styles are conceived not as fixed personality traits but as possibility-processing structures resulting from unique individual programming of the basic but flexible structure of human learning. These possibility-processing structures are best thought of as adaptive states or orientations that achieve stability through consistent patterns of transaction with the world (p.97).

**Experiential Learning Theory and the Team Learning Process**

Previous research has examined learning style in organizations (Carlsson et al., 1976; Kolb, 1976). In a study of organizational teams engaged in research and development activities at a major U.S. consumer products company, the experiential learning cycle provided an accurate and useful description of the team learning process. Three important findings related to team learning emerged from these organizational teams:

1. The most effective teams, as measured by supervisors and anonymous observers of the teams, progressed through each of the four phases of the learning cycle a number of times during the project life cycle.

2. The less effective teams became stifled in their development in several ways. First, teams often failed to cycle through all four phases of learning. The strengths and weaknesses of each team could be directly related to the phase the team ignored. For example, some teams spent too much time on creating new ideas, but failed to properly explore the practical aspects of their ideas. Other teams lacked creative ideas, but had developed great implementation strategies.
3. Teams that were assisted by a trained facilitator or had team members who were able to facilitate the team were able to improve the learning process by moving the team through each phase of the cycle in sequence.

The study of research and development teams demonstrates how experiential learning theory has both practical and theoretical implications in organizational and performance oriented settings (Carlsson et al., 1976). Kolb (1976; 1984) argues that learning style differences can be reflected as the characteristic problem solving and decision-making approaches found in different organizational units (teams). As teams engage in the multiple phases of the team learning process, they become more likely to express multiple viewpoints and explore problems from multiple angles and engage the diverse perspectives of team members. Thus, a brief conceptual illustration at this point seems appropriate. Based on Ponds (1965 as cited by Kolb, 1976), Figure 3 provides the best example to represent how experiential learning theory and learning styles relate to the problem solving and decision-making processes.
According to Kolb (1984) and others (Kolb et al., 2000; Mainemalis et al., 2002) individuals and teams learn best when they can cycle through all four modes of learning as depicted in Figure 3. In times of uncertainty or complexity, however, teams may find it difficult to move through the team learning cycle. For example, Kolb’s (1976; 1984) research suggests that organizations and professional disciplines often develop preferences which favor activity in one dimension of the learning cycle over the other. When these preferences are out of balance with the demands of the situation of the team or organization, challenges such as a team becoming stuck in or deficient in learning will ensue, resulting in the team’s lack of ability to learn and perform. Thus, when teams successfully navigate the learning process, they are likely to avoid some of the dysfunctional aspects of team life.
Kolb (1976) illustrates that the learning processes in each phase of the experiential learning cycle are most effective for the achievement of certain learning activities. To illustrate, teams whose members have a dominant diverging orientation will demonstrate a preference for identifying the multitude of possible problems and opportunities that exist. Teams whose members have a dominant assimilating orientation will demonstrate a preference for developing models that are necessary to prioritize and explore alternative solutions. Teams whose members have a dominant converging orientation will demonstrate a preference for the evaluation of solution consequences and solution selection. Lastly, teams whose members have a dominant accommodating orientation will demonstrate a preference for implementing solutions. Much of this research, however, has focused less on how differences in the aggregated composition of individuals within the team in terms of their learning style characteristics — what I refer to as learning style diversity — might affect the team learning process and outcomes. To expand our understanding on ELT, this dissertation empirically tests the above mentioned relationships.

**Hypothesis 4a:** Learning style diversity is positively associated with the team learning process.

**Balancing Team Learning: Matching Learning Abilities with the Demands of the Situation**

The balance of learning abilities required to meet the demand of the situation is likely to shift over the course of the team learning cycle. In the earliest phases of the
learning process (e.g., idea generation and planning), abilities related to the diverging and assimilating dimensions are likely to most critical. Later (e.g., when all proposals have been put forth and evaluated relative merits in terms of their feasibility for implementation), abilities related to the converging and accommodating dimensions become most critical. With this in mind, teams with a dominant learning preference – that is, where the majority of members have a valence toward a specialized learning style – will be strongly related to the corresponding phase within the team learning cycle (e.g., teams with dominant diverging style will be emphasize idea generation and planning). The following section illustrates how each of the learning styles matches the required learning activities in each phase of the experiential team learning cycle: idea creation, planning, decision-making, and implementation.

Idea Creation and the Diverging Style. This learning behavior requires team members to identify if there is a problem to be solved, a dilemma to be managed, or an opportunity to exploit. It requires members to create new ideas. Here, teams with a dominant diverging style will rely on the learning abilities of concrete experience (CE) and reflective observation (RO). Teams with this learning style are best at viewing their immediate experience and resulting information from many different points of view. They are then able to organize the information into a meaningful gestalt. As such, members enjoy working in their teams, listening with an open mind, and receiving feedback.

Hypothesis 4b: Diverging style, characterized by concrete experience (CE) and reflective observation (RO) is positively associated with idea creation.
Planning and the Assimilating Style. This learning behavior requires team members to engage in reflective discussion so that they may consider all their options and possibilities as it relates to the contextual task demands. Here, teams with a dominant assimilating style will rely on the learning abilities of abstract conceptualization (AC) and reflective observation (RO). Teams with this learning style are best at understanding a wide range of information and putting into concise, logical form. As such, members will more than likely explore analytical models and think things through before developing a finished product.

**Hypothesis 4c:** Assimilating style, characterized by reflective observation (RO) and abstract conceptualization (AC) is positively associated with planning.

Decision-making and the Converging Style. This learning behavior requires team members to select a viable solution or series of solutions to solve problems. The solution selected will become the basis for subsequent implementation. Here, teams with a dominant converging style will rely on the learning abilities of abstract conceptualization (AC) and active experimentation (AE). Teams with this learning style are best at finding practical uses for ideas and theories. They have the ability to solve problems and make decisions based on finding solutions to questions or problems, or whatever else might be required for the situation. As such, members will more than likely experiment with new ideas, simulations, and practical applications.

**Hypothesis 4d:** Converging style, characterized by abstract conceptualization (AC) and active experimentation (AE) is positively associated with decision-making.
Implementation and the Accommodating Style. This learning behavior requires team members to implement the final solutions selected for the existing situation. Here, teams with a dominant accommodating style will rely on the learning abilities of concrete experience (CE) and active experimentation (AE). Teams with this learning style have the ability to learn primarily from their collective experience or through trial-and-error. As such, members will more than likely carry out plans and tasks to complete a project. In addition, they will seek out new opportunities and take risks to enhance their collective ability to adapt and improve.

**Hypothesis 4e:** Accommodating style, characterized by active experimentation (AE) and concrete experience (CE) is positively associated with implementation.

Learning Style Diversity and Process Conflict

While any type of team diversity, particularly as it relates to subgroups may stimulate learning behavior (Gibson & Vermeulen, 2003), this dissertation argues that some are more likely to do so than others, based on the relevance of their corresponding preferences for problem solving and decision-making. Preferences most relevant to the team learning process (e.g., information processing) at hand are more likely to influence the interpretation of that learning behavior. Thus, team member learning styles corresponding to the experiential team learning cycle should be especially influential in the perception and interpretation of the team learning process.

Learning style affects the kinds of information about the situation that a team member may attend to in their social environment. Thus, learning style influences how an individual perceives a task and the appropriate approach to go about completing it to
guide behavior. It may also lead members in a team to disagree about tasks that involve establishing team goals, generating creative ideas, action planning, solving problems, making key decisions, and selecting the appropriate course of action. For example, members who are more prone to thinking and feeling typically see opportunities and issues from vantage points that differ from those who are more prone to action and reflection (Kolb, 1984). Due to their respective preferences, team members with different learning styles may have divergent perspectives and interpretations of task issues, including goals, key decision areas, and procedures. To the extent that individual team members perceive other members as having different learning abilities in response to the information-processing and task demands, the team’s likelihood them agreeing on how to execute problem or opportunity recognition and decision-making tasks increases.

**Hypothesis 5:** Learning style diversity is positively associated with process conflict.

**Learning Style Diversity and Team Performance**

While a considerable amount of research exists on the effects of demographic diversity on team process and outcomes, less exists on the effects of the diversity of learning styles. Research on the effects of the diversity of learning style in teams suggests that the cognitive process by which the transformation of experience creates knowledge will affect team outcomes. Individuals learn through four distinct styles. These styles, for example, may serve as another source a member uses for self-definition.

In the first experimental study of how learning styles of team members affect team performance, Wolfe (1977) compared performance on a complex computer business
simulation of homogeneous three person teams composed of members with an accommodating, diverging, assimilating, or converging style with heterogeneous learning style teams. While there were no differences in performance among the homogeneous learning style teams, teams composed of members with diverse learning styles performed better than the homogeneous learning style teams. Similarly, Kayes (2001) found that teams made up of members whose learning styles were balanced among the four learning modes performed at a higher level on critical thinking tasks than teams whose members had specialized learning styles.

Furthermore, Halstead & Martin (2002) found that randomly formed engineering student teams to include all learning styles performed better than self-selected teams. Sharp in her studies of engineering students stated that “classroom experience shows that students can improve teamwork skills with Kolb’s theory by recognizing and capitalizing on their strengths, respecting all styles, sending messages in various ways, and analyzing style differences to resolve conflict and communicate effectively with team members” (Sharp 2001, F2C-2).

Given the previous discussion, teams comprised of members where all four learning styles are represented will outperform teams comprised of members with similar learning styles. By the same token, heterogeneous learning style teams will respond and adapt to a wider range of contextual demands in organizations. This discussion implies the following:

Hypothesis 6: Learning style diversity will be positively associated with team performance.
Diversity of Member Composition and Team Tenure:

Implications for the Team Learning Process

Given the recent discussions, one might infer that high levels of the team learning process may be hard to obtain in diverse teams. If one adopts this premise, then what could make the difference? What could enable the team learning process to occur amid a diverse team across surface- and deep-level diversity as conceptualized by this dissertation? These questions are explored in this section to describe how team tenure moderates the diversity of member composition and the team learning process.

Teams change over time. The degree to which they change may be determined in part by the degree to which team members communicate necessary information and engage with one another over time. As members interact with each over time, team members will become more familiar with, accept, and perhaps to some extent appreciate the value of the different perspectives each member brings to bear. Similarly, team tenure may also weaken the in-group and out-group dynamics for social categories based on demographic attributes. So members who were once considered outsiders become perceived and treated as insiders (Kramer, 1991; Pelled et al., 1999). In this manner, longer team tenure may diminish any negative affects of demographic diversity. This notion is supported by what Bushe (2001) describes as pre-identity and post-identity groups. In post-identity teams – teams where most individuals identify with the team – members may see their social identity as including their team membership and that what affects the team affects them. In contrast, teams with a shorter tenure or pre-identity teams – teams where most members are not identified with the team – may be more prone to focus more on their social identity in a way that matches the beliefs and perceptions.
about survival in their unique environment (Bushe 2001). Until members feel there is a good fit between their salient social identity and the social identity acknowledged through membership in the team, the team remains in a pre-identity state (Bushe, 2001).

Grounded in the discussion above, the study of group development has existed for many years. Yet, there is much that we do not know about this process. Unlike other models of group development that follow a tradition or hierarchical sequence, Gersick’s (1984) model focuses on the movement of groups over time with fixed time-bound tasks. Gersick recognized that groups work through a variety of stages. She categorized these stages as definition, choice of direction, construction and evaluations. Gersick’s stages suggest that teams many not necessarily experience all of the stages of group development or they may experience one stage several times. Gersick’s model is referred to as the punctuated equilibrium model. The punctuated equilibrium model indicates that the timing of how teams form and change the way they work is very consistent. Consistent with this perspective, this dissertation hypothesizes that the effects of team diversity are moderated by a temporal factor – team tenure. To elaborate further, this study hypothesizes that demographic diversity will have negative consequences on the team learning process early in the life of a team. This effect will diminish as the team’s tenure working together increases. Conversely, learning style diversity will have weaker effects for teams with a shorter tenure working together, but positive effects will emerge as teams work together longer. These hypothesized relationships are based on Harrison et al.’s (1998) study that followed teams over time.

In their seminal work on surface- and deep-level diversity, Harrison et al. (1998) found that the more team members interacted and worked together, the effects of surface-
level diversity decreased, whereas deep-level diversity effects increased. Thus, as team
tenure accrues and the idiosyncratic patterns of behavior emerge, team tenure will result
in more information to be conveyed among members, expanding the team’s capabilities
to solve problems and make decisions, and thus, affecting team performance. Harrison et
al. (1998) wrote,

Time provides the opportunity to acquire information; the amount of information
acquired is a function of the length of shared experience for group members, the
breadth of group activities, the depth of task interdependence, and other factors. These exchanges allow group members to learn deeper-level information about
their psychological similarity to or dissimilarity from their co-workers, where
before they would have used surface-level demographic data as information proxies (p.104).

Teams that are unable to engage in productive interactions may hinder their
ability to engage in learning behavior and the accomplishment of their tasks, resulting in
lower levels of effectiveness. The more interaction that occurs between members of a
team, the greater the likelihood demographic attributes will be less pronounced, whereas
psychological attributes will more pronounced. For instance, Harrison et al. (1998) found
that the initial negative influence of gender diversity on cohesiveness was neutralized as
team members spent time together. In contrast, the impact of deep-level diversity
(member differences in overall job satisfaction) was strengthened over time and team
interaction increased. In a follow-up study, these effects were replicated in that the
negative impact of perceived surface-level diversity on team social integration
diminished, but the positive effect of perceived deep-level diversity grew (Harrison et al.,
2002). This relationship did not exist for groups where members spent a shorter amount
of time interacting with each other.
Likewise, Jehn et al. (1999) examined the interaction between surface- and deep-level diversity. Jehn et al. hypothesized that informational diversity (heterogeneity in the knowledge bases and perspectives members bring to the team) would increase performance when social category diversity (demographic diversity or differences between team members across social categories such as race and gender) was low. This prediction was supported, as informational diversity held a positive relationship with efficiency when social category diversity was low.

Furthermore, Watson et al.’s (1993) experimental study showed that homogeneous groups across demographic attributes initially scored higher on both group process and performance than heterogeneous groups. However, as group members interacted more frequently with each other, both types of groups improved on group process and performance, leading to no difference in group process or overall performance. Their study also showed that heterogeneous groups produced more ideas and offered different perspectives and alternatives than homogeneous groups. Hence, in teams with minimal interaction among members, demographic attributes will be more pronounced, whereas psychological attributes will be less pronounced.

These studies support the premise that teams where members spend more time working together outperform teams with a shorter tenure. This discussion implies the following:

**Hypothesis 7a:** High levels of team tenure will diminish the negative associations between demographic diversity and the team learning process.

**Hypothesis 7b:** High levels of team tenure will strengthen the positive associations between learning style diversity and the team learning process.
Team Learning and Team Performance

Numerous studies have demonstrated empirical support for a link between the team learning process and team performance. For example, in a study of 95 new-product development teams, Lynn et al. (1999) found that internal new-product development processes helped teams meet customer needs. In a multi-method field study of 51 work teams in a manufacturing company, Edmondson (1999) tested a model of team learning and showed that teams that engage in learning behavior are more effective. That is, improved performance and improved interpersonal relationships. Though the quality of interpersonal relationships is not a focus of this dissertation study, empirical support exists on the notion that the more a team engages in team learning behavior, the more it can produce a team environment of more effective learning (Zellmer-Bruhn & Gibson, 2006). This dynamic reflects a paradox of learning symbolized by a conundrum of a cycle that depends upon itself to get started (Smith & Berg, 1987).

In a series of studies, Edmondson (Edmondson et al., 2001; Edmondson, 2002) also demonstrated that teams that engage in reflection of team processes were more effective than teams who did not engage in such activities. Similarly, Gibson’s (Gibson & Vermeulen, 2003; Zellmer-Bruhn & Gibson, 2006) research also demonstrates that team learning behavior increases team performance. In a study of 115 teams across five multinational pharmaceutical and medical products firms, they found that teams with higher learning had higher task performance as rated by their leaders. Hence, teams engaged in more learning behavior will facilitate the team’s ability to reach its goals more easily and with better results.

**Hypothesis 8:** The team learning process is positively associated with team performance.
The Team Learning Process:

A Mediator between Diversity of Member Composition and Performance

Guzzo’s (1995) description of problem solving and decision-making vis-à-vis, gathering, interpreting, and exchanging information; creating and identifying alternative courses of action; choosing among alternatives by integrating the often-differing perspectives and opinion of members; and implementing a choice and monitoring its consequences complements the cycle of activities that teams engage in known as the team learning process. An organizational team’s ability to effectively learn and perform is attributed to their progression through all four phases of the learning cycle – that is, the nature in which individuals select and process information to be used to enhance the quality of the team’s products or services as well as its ability to adapt and improve. Kolb’s (1976) study of the relationship between learning styles and managerial problem solving builds on this idea.

In an attempt to illustrate the ways in which the learning cycle and individual learning styles affect problem solving and decision-making processes, Kolb (1976) found that teams that emphasized all four learning styles performed better than teams that specialized in one particular learning mode. Similarly, Carlsson et al. (1976) found that the members of teams who shared their individual learning style publicly with other members identified important differences among themselves, and quickly came to understand how their learning style differences influenced their process for working together.

As members learn from one another, they can increase the total pool of talent available for accomplishing team tasks (Hackman, 1987; Edmondson, 1999). Kayes et al.
(2005) support this idea by asserting, “teams can increase their effectiveness and team members can develop team skills when a team intentionally focuses on learning” (p.331). To accomplish this, first, team members must build relationships or maintain good working relationships on the team through the process of concrete involvement. Second, a team has to generate ideas on how to improve its work through planning, in which team members search for potential improvements so that a workable outcome can be developed. Third, through a process of decision-making, a team must transfer and combine insights to arrive at a common understanding about the proposed solutions. Lastly, knowledge must be translated into concrete, generalized concepts, decisions or action items and carried out through a process of implementation.

This premise highlights the importance for understanding and managing differences as they relate to the learning behavior required for teams to meet objectives such as increasing efficiency, improving effectiveness, developing the capacity of individual team members, or solving complex problems (Edmondson, 1999; Argote, et al., 1999) to affect team members’ performance favorably. This discussion implies the following hypotheses:

**Hypothesis 9a:** The team learning process mediates the relationships between demographic diversity and team performance.

**Hypothesis 9b:** The team learning process mediates the relationships between learning style diversity and team performance.
The Team Learning Process and Process Conflict

Lower levels of process conflict will theoretically enable organizational work teams to engage in productive processes, such as goal setting and brainstorming. However, a review of the literature about group development indicates there are some positive and some negative supporting evidence for a relationship between group stages of development. This evidence is primarily supported by the outcomes from studies of group process in decision-making. Based on Bales and Strodtbeck’s (1951) study of twenty-two groups, they suggest that development in decision-making groups is determined by situational and group characteristics. For example, fifteen groups in Bales & Strodtbeck’s (1951) study revealed a variety of group development patterns. Meanwhile, the other seven of twenty-two groups followed a more traditional hierarchical sequence. Based on their findings, these theorists suggest that no single or specific stage of development is related to group effectiveness in decision-making groups. If group development in organizational work teams is affected in a manner similar to that of decision-making groups, then it would be expected that no single group development pattern would predict group effectiveness. Hence, the development of work teams, like that of decision-making groups may be determined by situational factors. This suggests that there may be no specific relationship between group development sequences and group outcomes.

Hypothesis 10: The team learning process is negatively associated with process conflict.
Team Task: Implications for the Team Learning Process and Team Performance

One factor that influences the extent to which teams engage in the team learning process that facilitates performance effectiveness rests on the type of task being performed by a team (Edmondson, 1999; Gibson & Vermeulen, 2003). A task is defined as the work-related activities that team members perform (Goodman, 1986). The task concept has been included as a moderator of team process in a number of team models (e.g., Gladstein, 1984). For example, McGrath (1984) developed a typology that looks at how routine a task is. A similar distinction is made by Perrow (1970) in his discussion of technology and tasks. Routine tasks, which is defined as the amount of variety in methods and repetitiveness of task processes (Hall, 1972), are generally familiar and done in the same way each time with predictable results (e.g., typing letters, data entry, assembly line). In contrast, non-routine tasks require advanced cognitive processes such as problem-solving (Perrow, 1970; McGrath, 1984). Non-routine tasks are cognitive or thinking tasks that have few set procedures and typically involve a great deal of variety and uncertainty. Task uncertainty refers to tasks which include a large amount of variability in processing and which have predictable outcomes (Van De Ven et al., 1976). Conversely, routine tasks have a low level of variability and are more familiar and redundant in nature. Based on this discussion, non-routine task performing teams will more likely be stimulated to engage in the team learning process.

Gersick and Hackman (1990) found that groups with established habitual routines will maintain these habits even in situations that require alternative behaviors. Further, research on organizational teams has typically focused on teams that primarily perform non-routine tasks, such as decision-making and planning (McGrath, 1984; Levine &
Moreland, 1990). Teams performing non-routine tasks benefit from diverse ideas of team members. When members tend to agree with other team members about ideas, proposed solutions, or actions at the expense of presenting dissenting viewpoints, alternative solutions can be overlooked. Researchers have suggested that thoughtful consideration of alternative solutions enhances decision-making and performance in teams with complex tasks (Jackson, 1990; Jehn et al., 1997; 1999). As such, differing viewpoints elicit alternative consequences in teams performing primarily non-routine tasks. Thus, heterogeneous learning style teams and the extent to which they perform non-routine tasks will more than likely enhance their performance effectiveness.

**Hypothesis 11:** The relationship between the team learning process and team performance is higher when the team’s task is non-routine.

**Summary of Theory and Literature**

My primary purpose in conducting this study has been to link four powerful theoretical paradigms — the social identity perspective, embedded intergroup relations theory, experiential learning theory and the task group effectiveness input-process-output framework—which, taken together, may offer valuable insight into the further development of team learning theory in organizational teams. Therefore, it is important to note that in this chapter introduces the model of member composition and the team learning process used to test hypotheses in this study.

The model tested in this dissertation links variations in team diversity with the team process and outcomes. As such, in the first section, I define the domain within the field of organizational behavior this study intends to contribute. Then I use the theories of
the social identity perspective and embedded intergroup relations to explain how and why
individual team members separate themselves into social group memberships. Next, I
review the research on the effects and outcomes associated with various forms of
demographic diversity. In the section that follows, I survey the literature on experiential
learning theory in order to establish the case for determining the extent to which the
collective learning process commensurate with Kolb’s (1984) theory can deepen our
understanding of team learning – particularly as it relates to the concrete dimensions of
the cycle. I also introduce the previously unstudied concept of learning style diversity. I
also evaluate how these different theoretical perspectives link to the contextual factors
team tenure and team task as potential moderators of the relationship between team
diversity-team learning-team outcomes framework.

Based on the preceding literature review, teams are inherently intergroup in nature
because they encompass interpersonal interactions between people with different social
group memberships in a social system. They are potential breeding grounds for subgroup
formation and they are socially embedded within a larger organizational and societal
context. As a result, the dynamics on which the effects of social stratification based on
demographic diversity is constructed – including historical and societal (Alderfer, &
Smith, 1982) – may affect member perceptions, and consequently, the team learning
process – making embedded intergroup relations and the social identity perspective key
theories to this study.

In addition, as team tenure increases among team members, heterogeneous teams,
based on demographic attributes, may lead to improved relationships among the people in
the team who differ from each other and subsequently, lead to an increase in learning
behavior. Accordingly, a negative relationship between demographic diversity and the team learning process may be more pronounced early in a team’s formation or life-cycle. However, the negative influence of demographic diversity on team members may diminish over time, because patterns of behavior or attributes not readily apparent will surface that may disconfirm unfounded stereotypes (Chatman & Flynn, 2001) as other behaviors emerge (Pelled, 1996; Harrison et al., 1998; 2002). Once more accurate knowledge of deep-level diversity is obtained; psychological attributes will subsequently become more important as team members continue to interact with one another more frequently (Pelled et al., 1999; Harrison et al., 1998; Harrison et al., 2002).
CHAPTER 3: METHOD

In Chapter 2, I discussed several areas of theory and empirical research. I also presented the research model and guiding hypotheses on which this study is based. In this chapter, I describe the dissertation’s field study design to test the aforementioned hypotheses which consisted of two phases: a pilot study and a main study. The pilot study was intended to assess the construct validity of the new and adapted measures. The pilot study also focused on the ease of technology to assess the extent to which the Team Learning Inventory and Learning Style Inventory could be accessed behind the company firewalls as well as to obtain reactions for completing the two surveys across two different websites. The main study, on the other hand, incorporated the feedback from the pilot. In addition, I describe the measures, survey instruments, and statistical procedures used.

Pilot Study

Seven teams across three consulting firms participated in this preliminary investigation. They were provided two weeks to complete the survey. During the first week, team members completed the survey. During the second week, I asked for feedback on the survey (e.g., whether they found the web-enabled technology to be user friendly, instructions clear, or if they found questions to be ambiguous or unclear, whether they had any suggestions to improve it, and whether they had any additional reactions to it).

The discoveries made encompassed a number of typos as well as lengthy and repetitive survey instructions and error messages in the use of the technology. Pilot
participants felt that the directions were a bit awkward. They suggested that the directions be revised and made to be more user friendly. Another focused on sentence structure. For example, the questions related to the sections related to: 1) how many times do members of your team spend interacting on a monthly basis and 2) the percentage of time does the work done in your team consist of factors related to the team learning process. The original intent was to have the percentages total 100%. However, the feedback I received from pilot participants suggested that it was unlikely in some cases that all four characteristics in the team learning process would exist in a team. In fact, to avoid the likelihood of receiving fictitious data, it was suggested to me that I not try and force the summation of the question responses to add to 100%.

Since the scales that comprised The team learning process were adapted to fit the aspects relevant to the study, a primary objective of the pilot study was to assess their construct validity. To do this, I conducted an analysis of the survey responses using Cronbach’s (1951) alpha test of reliability. The results of this analysis showed that the items measuring the team learning process were of acceptable reliability. Hence, I determined that the items in the team learning process scales measured what they intended to measure.

Based on the pilot participants’ verbal feedback, I made significant changes to the instructions, sentence structure and layout of the survey. I did this by incorporating the proposed additions, deletions and changes in wording to make the instructions and questions items more clear and relevant for future respondents. These results were subsequently used to guide the Main Study (below).
Main Study

At the onset of the research study, 58 public and private sector organizations were identified as potential participants. Although many of these organizations ranged in size and focus, for purposes of consistency and coherence, participants were limited to those organizations that used intact teams with fixed time-bound tasks to solve problems and make decisions. Based on Hackman’s (2002) four criteria, the teams comprised of at least three or more members in this study were selected based upon their having: (1) a clear task, (2) clear boundaries, (3) clearly specified authority to manage their own work processes, and (4) stable membership.

The sample of potential organizations were contacted by email and invited to participate in the survey. The results of these invites yielded responses of interest that narrowed the list to 28 organizations. This list subsequently became the targeted participant pool. All of the 28 target organizations were then contacted by phone and email to verify whether they could provide the time and resources required to participate in the survey. They were assured that their individual, team, and organizational data would remain confidential and their identities anonymous in the executive summary report of the results. A free learning style profile report, valued at $15.00 was offered for participation.

The final set of actual participating organizations was comprised of 13 of the 28 organizations. The distilled list was attributed to a number of organizations that did not respond and/or did not have the adequate resources to provide teams that would satisfy my requested criteria. Completion of the Team Learning Inventory and Learning Style Inventory was accomplished during the two month administration period. The surveys
were designed to focus on the areas of problem solving and decision-making, the percentage of time teams spent engaged in the team learning process, how they viewed their performance, and the preferences for grasping and organizing information.

At 10 out of 13 sites, my contact person was a member of the leadership team of the participating teams or a member of human resources/organization development function. My contact at the three other sites included the Chief Technology Officer, a Project Manager and a U.S. Army Officer. I asked each contact to provide access to a set of teams, each having no less than three or more members, engaged in some form of interaction (e.g., face-to-face, one-on-one, email, phone) at least once a week, and was at least a few weeks old. I also specified that I wanted a variation in the teams and was not limited to conducting an investigation with a particular type of team. With the representatives’ assistance, I was able to identify teams across functional and specialized departments and team types to participate.

Survey Response Rates

In many instances, teams were asked to fill-out surveys during work and evening hours and over the weekend by their team leaders, managers, directors, etc. In total, 61 participating teams were identified by my points-of-contact. The team leaders received correspondence from me and from the point-of-contact requesting to participate. A total of 323 participants (61 teams) received access to the survey. Of that 323, only 225 participants (70% response rate) voluntarily responded to the survey.
Due to the volunteer nature of completing the survey, of the 61 teams:

- 8 teams did not complete the surveys
- 53 teams responded to the surveys
- 10 teams only had one respondent who completed the surveys
- Final $N$ resulting in 43 teams

The survey sites were left open for an extended period of time (3.5 weeks) and in many cases, teams continued to express a desire to participate, but consistently reported being too busy to respond or having other priorities emerge. Despite the numerous reminders sent to increase participant responses, the outcome was unsuccessful.

For the purposes of this dissertation, some teams were excluded from the analysis. The excluded teams were too large or widely dispersed. Through careful review and analysis, it was determined that 33 teams met the requirement of completing both surveys and responding to the relevant demographic information required for the diversity scores (4 teams did not complete the necessary demographic information of the LSI and 6 teams had less than 50% representation). The decision to exclude teams with less than 50% representation was based on the premise that any finding that assumed regular interaction between members of the team would differ significantly from team to team as a result of varying degrees of survey responses. Lastly, it is important to note, that the demographic information was a critical component of the study. Without adequate demographic information or team representation, the analysis would be severely compromised. The analysis led me to decrease the sample size from 43 to 33 teams. This was done to
maximize the likelihood of comparing teams that were comparable in terms of the representation of size and respondent demographics.

Sample

A total of one hundred eighty one individuals participated in the survey. 15 responses for demographic data based on gender were missing, resulting in one hundred sixty five participants of which 62 (34.3%) Male and 103 (56.9%) were Female. Frequencies and percents for participants Ethnicity are presented in Table 1. Frequencies and percents for participants Martial Status are presented in Table 2 (See Appendix K).

13 responses for demographic data based on education were missing, resulting in one hundred sixty eight participants of which 52 (28.7%) participants hold No Degree, 69 (38.1%) hold a Bachelors Degree, 45 (24.9%) hold a Masters Degrees and 2 (1.1%) hold a Doctorate. Frequencies and percents for participants Country of Residence are presented in Table 3 (See Appendix K). Frequencies and percents for participants Age Range are presented in Table 4 (See Appendix K). 13 responses for demographic data based on age were missing, resulting in one hundred sixty eight participants of which 81 (44.8%) of the participants are considered Junior, 78 (43.1%) are considered Mid-Career and 9 (5%) are considered Seasoned.

Frequencies and percents for participants Team is presented in Table 5 (See Appendix K). The mean response for how long participants worked with the company (organizational tenure) was 5.79 (SD = 5.82) and for how long the participant worked with their team (team tenure) was 4.97 (SD = 2.97). Frequencies and percents for participants Industry is presented in Table 6 (See Appendix K). Table 7 (See Appendix
K) presents the frequency and percents for participants’ Job Level. Team sizes ranged from 2-29 with an average of 5.

The sample distribution of learning style scores was consistent with Kolb’s (2005) normative sample of 6,977 individuals used to calibrate the instrument. Each of the four dimensions fell within three points and most within one point of the normative sample on each cut-point. A comparison of the normative sample and the study sample are displayed in Table 8.

### Table 8

*Comparison of Normative and Study Sample on Learning Style Dimensions*

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<td>6977</td>
<td>6.83</td>
<td>11.69</td>
<td>169</td>
<td>6.70</td>
<td>13.10</td>
</tr>
<tr>
<td>AE-RO</td>
<td>6977</td>
<td>5.96</td>
<td>11.63</td>
<td>169</td>
<td>4.77</td>
<td>13.98</td>
</tr>
</tbody>
</table>

N=6977
N=169; 12 Missing
Measures of Diversity of Member Composition

Demographic Diversity. Demographic diversity is based on three demographic attributes: age, race, and gender. To construct an aggregate measure of demographic diversity within teams (Jehn et al., 1999), I computed separate measures of diversity for each of the demographic attributes – age diversity, race diversity and gender diversity within work teams – using an entropy-based index (Teachman, 1980; Ancona & Caldwell, 1992). This index is the most widely accepted measure for providing information in an empirical distribution (Allison, 1978; Tsui & Gutek, 1999), particularly for categorical variables.

To accomplish this, Age was measured first on an ordinal 7-point scale (1 = Under 19; 2 = 19-24 years old; 3 = 25-34 years old; 4 = 35-44 years old; 5 = 45-54 years old; 6 = 55-64 years old; 7 = 65 and Over). To provide consistency in using the entropy-based index for categorical variables, a series of dummy variables were created for age and coded as 1 = Junior (e.g., Under 19 and 19-24 years old), 2 = Mid-Career (e.g., 25-54 years old), and 3 = Seasoned (e.g., 55 and Over). Race was coded as American Indian/Alaskan Native = 1, Asian = 2, Black/African American = 3, Caucasian = 4, Hispanic/Latino = 5, Pacific Islander = 6, and Other = 7. Gender was also categorical and coded as Female = 1 and Male = 2. Next, I standardized each of the variables and added them to arrive at a composite measure of total team demographic diversity.

Next, using the same index, I computed an aggregate self-report measure of demographic diversity using the formula:

\[ H = - \sum_{i=1}^{s} P_i (\ln P_i) \]
where $P_i$ is the proportion of the team that has each demographic diversity attribute. Thus, the diversity index represents the sum of the properties of each attribute’s proportion in the makeup of the team and the natural log of its proportion. In other words, the formula uses the categorical representations’ fractional share of total categories represented for each team to index the heterogeneity in the team. This index ranges from 0 (completely homogeneous) to a theoretical high of 1 (completely heterogeneous). Therefore, the greater the distribution across the specific attributes, the higher the diversity score within each work team. That is, the higher the overall diversity score, the more demographically different members are from other individuals within their team in terms of demographic attributes (age, race, and gender).

**Learning Style Diversity.** The Learning Style Inventory, (LSI; Version 3, Kolb, 1999a) was used to obtain measures of learning preferences proposed by David Kolb (1971, 1984). David Kolb, Professor of Organizational Behavior at Case Western Reserve University bases the LSI on how individuals learn, discussed in his book, *Experiential Learning: Experience as the Source for Learning and Development* (1984). The LSI is a self-report inventory comprised of 12 items, where participants are asked to rank a set of words to indicate to what extent the words are consistent with their self-perceptions. The way in which participants rank order the descriptors indicates their preference on the four different learning modes: concrete experience (CE), abstract conceptualization (AC), reflective observation (RO), and active experimentation (AE). The inventory yields six scores, CE, RO, AC, AE, plus two combination scores, AC-CE and AE-RO. The CE, RO, AC, AE scores indicate the participants learning orientation
along one of four types of learning styles: diverging style, assimilating style, converging style, and accommodating style. The combination score indicates the extent to which an individual prefers abstractness to concreteness (AC-CE) and action over reflection (AE-RO) (Kolb, 1984). Once, learning style scores for each of the four dimensions is calculated, scores for the two interdependent dimensions are combined to arrive at one score each for: 1) AC-CE and 2) RO-AE. Because the four different learning modes are based on ipsative measurement (forced choice or ranking) versus categorical or interval data, I standardized each of the two interdependent dimensions variables and aggregated the two standard deviation coefficients to arrive at a composite measure of total team learning style diversity. These scores were desirable primarily for two reasons. First, because standard deviation coefficients consider absolute differences, it was discovered that this approach revealed stronger relationships with the variables of interest in this study. This finding was discovered after running a series of Pearson correlations using an entropy-based index to compute learning style diversity. In running these correlations, I determined that no relationships were revealed. Hence, confirming standard deviation coefficients as a better measure for learning style diversity.

Based on this rationale, it is important to note that the standard deviation is the most common measure of dispersion, measuring how widely spread the values in a sample are from the mean. In other words, the standard deviation measures variability. The larger the difference between the primary dimensions of learning style and the average, the higher the standard deviation will be and the higher the diversity. The closer the primary dimensions of learning style are to the average, the lower the standard deviation and the lower the diversity.
Measures of the Team Learning Process

Team Learning Process. The team learning process was measured on 7-point Likert scales ranging from 1 (Very Inaccurate) to 7 (Very Accurate). These items were completed at the individual level and aggregated to achieve a mean score for each team. Idea Creation was measured using items adopted from Gibson & Vermeulen’s (2003) measure of experimentation and reflective communication. Planning was measured using items adopted from Gibson & Vermeulen’s (2003) 3-item measure of knowledge codification. Drawing on Campion et al.’s (1993) communication/cooperation within a work group and Dechant & Marsick’s (1993) integrating perspectives, decision-making was measured using a 3-item measure. Implementation was measured using items adopted from Dechant & Marsick’s (1993) measure of experimenting. Each learning behavior was measured separately and then aggregated to form the team learning process variable.

Measures of Team Performance

Team Performance. Hackman’s (1987) team performance scale, as cited by Edmondson (1999) and items adopted from the Team Diagnostic Survey’s (TDS; Wageman, Hackman, & Lehman, 2005) were used to obtain self-report measures of the quality of the team’s output (products or services). Team performance was measured on a five-item 7-point Likert scale ranging from 1 (Very Inaccurate) to 5 (Very Accurate) to satisfy the performance dimension in the well recognized definition by Hackman – “meeting or exceeding the performance standards of the people who receive and/or review the team’s output” (p.323).
Moderator Variables

Team Tenure. *Team tenure* was measured by the aggregate of the average length of time each member has been working with his or her current team.

Team Task via routine task was also a moderator variable because the literature on the team learning process and performance effectiveness suggests that the team learning process may be less of an issue for work teams with routine tasks (Gibson & Vermeulen, 2003) and the nature of the team’s task may influence performance (Gladstein, 1984; Hackman, 1987). *Routine task* was measured on 7-point Likert scale ranging from 1 (Very Inaccurate) to 7 (Very Accurate) using Gibson & Vermeulen’s (2003) 3-item measure adopted from Withey, Daft, & Cooper (1983). High values will reflect task routineness. All scales are listed in Table 9.
<table>
<thead>
<tr>
<th>Team Learning Inventory Scales</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team Learning Process Scales</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Idea Creation</strong> (Adapted from Experimentation &amp; Reflective Communication, Gibson &amp; Vermeulen, 2003)</td>
<td></td>
</tr>
<tr>
<td>1. This team comes up with many new ideas about how work should be done.</td>
<td></td>
</tr>
<tr>
<td>2. Team members maintain a high level of idea exchange to capture our good ideas.</td>
<td></td>
</tr>
<tr>
<td>3. As a team, everyone has a chance to express their opinion.</td>
<td></td>
</tr>
<tr>
<td>4. This team has members who are sensitive to each other’s feelings.</td>
<td></td>
</tr>
<tr>
<td><strong>Planning</strong> (Adapted from Knowledge Codification, Gibson &amp; Vermeulen, 2003)</td>
<td></td>
</tr>
<tr>
<td>1. This team carefully plans for how we will proceed with our work.</td>
<td></td>
</tr>
<tr>
<td>2. This team is good at testing theories and ideas to accomplish its work.</td>
<td></td>
</tr>
<tr>
<td>3. This team makes time to consider alternative solutions before taking action.</td>
<td></td>
</tr>
<tr>
<td><strong>Decision-making</strong> (Adapted from Communication/Cooperation within Group, Campion et al., 1993)</td>
<td></td>
</tr>
<tr>
<td>1. In making decisions, our team weighs the cost and benefits of possible solutions.</td>
<td></td>
</tr>
<tr>
<td>2. Our process of making decisions is cooperative.</td>
<td></td>
</tr>
<tr>
<td>3. Our team has a hard time making decisions. (Reverse)</td>
<td></td>
</tr>
<tr>
<td><strong>Implementation</strong> (Adapted from Experimenting, Dechant &amp; Marsick, 1993)</td>
<td></td>
</tr>
<tr>
<td>1. We often learn through trying out new behaviors.</td>
<td></td>
</tr>
<tr>
<td>2. Members try out new approaches to their jobs as a result of the team’s work.</td>
<td></td>
</tr>
<tr>
<td>3. We are very good at implementing the decisions we make.</td>
<td></td>
</tr>
<tr>
<td>4. When we implement actions, we receive feedback on the results.</td>
<td></td>
</tr>
<tr>
<td><strong>Team Outcome Scales</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Team Performance</strong> (Adapted from Wageman et al., 2005 and Hackman, 1987)</td>
<td></td>
</tr>
<tr>
<td>1. Our team fulfills the products or services for those who receive or use it.</td>
<td></td>
</tr>
<tr>
<td>2. Our team achieves its goals.</td>
<td></td>
</tr>
<tr>
<td>3. Our team does high quality work.</td>
<td></td>
</tr>
<tr>
<td>4. Our team serves the purpose it is intended to serve.</td>
<td></td>
</tr>
<tr>
<td>5. Critical quality errors occur frequently in our team. (Reverse)</td>
<td></td>
</tr>
</tbody>
</table>
Process Conflict (Shah & Jehn, 1993)
1. How often do members of your team disagree about who should do what?
2. How frequently do members of your team disagree about the way to complete a team task?
3. How much disagreement is there about delegation of tasks within your team?

Moderator Variable Scales

Team Tenure
Measured by the length of time each team member has been in his or her current team.

Team Task (Routine Task as cited in Gibson & Vermeulen, 2003)
1. Our work is routine.
2. People in this team do about the same job in the same way most of the time.
3. Team members perform repetitive activities in time.
Psychometric Properties of Measures

Preliminary analysis of psychometric properties revealed that Learning Style Diversity, using the compositional approach, revealed no significant relationship with the dependent variables of interest. Through analysis, it was determined that the learning modes (e.g., CE, RO) provided higher correlation scores than learning styles (e.g., Diverging, Converging). As such, the aggregated standardized deviation coefficients for the combined scores of ACCE and AERO provided a better index for measuring Learning Style Diversity.

Due to there non-association with the dependent variables of interest (the team learning process), it was determined that the “categorical” approach for learning style was not a reliable source to measure learning style diversity. Instead, this study used combined dimensional scores (e.g., AE-RO) rather than an overall learning style (e.g., diverging). This path was chosen as a result of prior research that demonstrates combined dimension scores as having psychometrically strong properties (Loo, 1999A; Loo, 1999b). Further, consistent with demography/diversity research, the sum of the standardized learning mode scores of AE-RO and AC-CE were aggregated and used as a measure for learning style diversity. This measure was used for modified analyses.
According to Kenny and LaVoie (1985), to qualify as a group-level variable, two features must be present. A variable must be conceptually meaningful at the group level of analysis and its intraclass correlation coefficient (ICC) must be greater than zero. The ICC utilizes ANOVA to compare between- and within-group variance. For example, The team learning process ($r_{icc}=.51$) and Routine Task ($r_{icc}=.64$) have the highest ICCs in the sample. This suggests a combination of high within-team agreement and high between-team variance. Process Conflict also had a relatively high ICC ($r_{icc}=.55$) and thus, suggests that these variables are distinguishing teams from one another. As a contrast,
ICCs are near zero for Team Performance ($r_{ic}=.05$) suggesting that this construct is less likely to be shared by members of a team while varying across teams.
CHAPTER 4: RESULTS

This study tests a model of the team learning process in organizational settings. This model is based on experiential learning theory, team diversity, and team performance. Variables related of interests are organized into an input-process-output model. Subsequently, the model in this study emphasizes the role of team composition – demographic diversity and learning style diversity in relation to the team learning process and team performance. As such, this chapter presents the results of the dissertation study. The results are derived from the analysis of survey data that test specific hypotheses related to the model of team learning.

Findings

Hypotheses 1 through 7 and 9 through 11 were tested using correlational analyses. Hypotheses 8a and 8b were tested using simple regression. All of the study variables were aggregated. As such, tests of the study’s hypotheses were conducted using data aggregated at the team level and analyzed 1-tailed test.

Hypothesis 1. Demographic Diversity is negatively associated with the Team Learning Process.

To test this hypothesis, demographic diversity and the team learning process scale were examined as total scores as well as partitioned into their component parts. As such, correlations were calculated between 1) the total scores for both demographic diversity and the team learning process; 2) each type of demographic diversity and the team learning process; 3) demographic diversity and each sub-scale of the team learning
process scale; and 4) each type of demographic diversity and each sub-scale of the team learning process scale. A negative relationship was revealed between both race diversity and idea creation ($r = -.23$, $p < .09$). This relationship was marginally significant. The results reveal that no other significant relationships exist between the variables (see Table 11).

**Table 11**

*1-tailed Pearson Correlations between Demographic Diversity and the Team Learning Process (N=33)*

<table>
<thead>
<tr>
<th></th>
<th>Team Learning</th>
<th>Idea Creation</th>
<th>Planning</th>
<th>Decision-making</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demographic Diversity</td>
<td>$r = -.10$, $p &lt; .27$</td>
<td>$r = -.12$, $p &lt; .25$</td>
<td>$r = .10$, $p &lt; .28$</td>
<td>$r = .02$, $p &lt; .43$</td>
<td>$r = -.11$, $p &lt; .26$</td>
</tr>
<tr>
<td>2. Age Diversity</td>
<td>$r = -.05$, $p &lt; .35$</td>
<td>$r = -.12$, $p &lt; .25$</td>
<td>$r = .13$, $p &lt; .22$</td>
<td>$r = .00$, $p &lt; .49$</td>
<td>$r = -.07$, $p &lt; .34$</td>
</tr>
<tr>
<td>3. Gender Diversity</td>
<td>$r = .03$, $p &lt; .41$</td>
<td>$r = .13$, $p &lt; .23$</td>
<td>$r = .02$, $p &lt; .45$</td>
<td>$r = .25$, $p &lt; .07$</td>
<td>$r = .03$, $p &lt; .41$</td>
</tr>
<tr>
<td>4. Race Diversity</td>
<td>$r = -.18$, $p &lt; .15$</td>
<td>$r = -.23$, $p &lt; .09$</td>
<td>$r = .04$, $p &lt; .40$</td>
<td>$r = -.15$, $p &lt; .19$</td>
<td>$r = -.12$, $p &lt; .24$</td>
</tr>
</tbody>
</table>

**Correlation is significant at the .01 level (1-tailed)**

**Correlation is significant at the .05 level (1-tailed)**

**Hypothesis 2. Demographic Diversity is positively associated with Process Conflict.**

A Pearson correlation was conducted to examine if a relationship exists between demographic diversity and process conflict or by age diversity, gender diversity or race diversity and process conflict. A positive relationship was revealed between both race diversity and process conflict ($r = .23$, $p < .09$). This relationship was marginally significant. The results indicate that no significant relationships exist between
demographic diversity and process conflict or by age diversity or gender diversity and process conflict (see Table 12).

Table 12

1-tailed Pearson Correlations between Demographic Diversity and Process Conflict
(N=33)

<table>
<thead>
<tr>
<th>Demographic Diversity</th>
<th>Process Conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demographic Diversity</td>
<td>$r = .17, p &lt; .16$</td>
</tr>
<tr>
<td>2. Age Diversity</td>
<td>$r = -.02, p &lt; .44$</td>
</tr>
<tr>
<td>3. Gender Diversity</td>
<td>$r = .19, p &lt; .13$</td>
</tr>
<tr>
<td>4. Race Diversity</td>
<td>$r = .23, p &lt; .09$</td>
</tr>
</tbody>
</table>

** Correlation is significant at the .01 level (1-tailed)
* Correlation is significant at the .05 level (1-tailed)

**Hypothesis 3. Demographic Diversity is associated with Team Performance.**

To test this hypothesis, demographic diversity and the team performance scale were examined as total scores as well as partitioned into their component parts. As such, correlations were calculated between 1) the total scores for both demographic diversity and team performance; 2) each type of demographic diversity and team performance; 3) demographic diversity and each item of the team performance scale; and 4) each type of demographic diversity and each item of the team performance scale. The results of these relationships are as follows.

First, a negative relationship was revealed between gender diversity and team performance ($r = -.26, p < .07$). This relationship was marginally significant. Second, a significant negative relationship was revealed between demographic diversity “critical
quality errors occur frequently in our team” ($r = -.36, p < .01$). Third, a significant positive relationship was revealed between both gender diversity and “our team serves the purpose it is intended to serve” ($r = .35, p < .02$) and gender diversity and “our team achieves its goals” ($r = .29, p < .04$). Fourth, a negative relationship was revealed between gender diversity and “critical quality errors occur frequently in our team” ($r = -.24, p < .08$). This relationship was marginally significant. Lastly, a significant negative relationship was revealed between race diversity and “critical quality errors occur frequently in our team” ($r = -.34, p < .02$) and “our team does high quality work” ($r = -.36, p < .01$). No other significant relationships were revealed (see Table 13).

**Table 13**

*1-tailed Pearson Correlations between Demographic Diversity and Team Performance (N=33)*

<table>
<thead>
<tr>
<th>Demographic Diversity</th>
<th>Team Performance</th>
<th>Our team serves the purpose it is intended to serve.</th>
<th>Our team fulfills the products or services for those who receive or use it.</th>
<th>Critical quality errors occur frequently in our team (Reverse)</th>
<th>Our team does high quality work.</th>
<th>Our team achieves its goals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$r=.08, p&lt;.32$</td>
<td>$r=.09, p&lt;.29$</td>
<td>$r=.07, p&lt;.33$</td>
<td>$r=-.36^*, p&lt;.01$</td>
<td>$r=-.08, p&lt;.31$</td>
<td>$r=.17, p&lt;.16$</td>
</tr>
<tr>
<td>2. Age Diversity</td>
<td>$r=-.10, p&lt;.27$</td>
<td>$r=.02, p&lt;.44$</td>
<td>$r=.21, p&lt;.11$</td>
<td>$r=.18, p&lt;.14$</td>
<td>$r=.04, p&lt;.39$</td>
<td>$r=.01, p&lt;.46$</td>
</tr>
<tr>
<td>3. Gender Diversity</td>
<td>$r=.26, p&lt;.07$</td>
<td>$r=.35^*, p&lt;.02$</td>
<td>$r=.15, p&lt;.19$</td>
<td>$r=-.24, p&lt;.08$</td>
<td>$r=.14, p&lt;.21$</td>
<td>$r=.29^*, p&lt;.04$</td>
</tr>
<tr>
<td>4. Race Diversity</td>
<td>$r=-.17, p&lt;.17$</td>
<td>$r=-.12, p&lt;.25$</td>
<td>$r=-.21, p&lt;.11$</td>
<td>$r=-.34^*, p&lt;.02$</td>
<td>$r=-.36^*, p&lt;.01$</td>
<td>$r=.11, p&lt;.12$</td>
</tr>
</tbody>
</table>

*Correlation is significant at the .01 level (1-tailed)*

**Correlation is significant at the .05 level (1-tailed)**
Hypothesis 4a. Learning Style Diversity is positively associated with the Team Learning Process.

To test this hypothesis, learning style diversity and the team learning process scale were examined as total scores as well as partitioned into their component parts. As such, correlations were calculated between 1) the total scores for both learning style diversity and the team learning process; 2) each type of learning style diversity and the team learning process; 3) learning style diversity and each sub-scale of the team learning process scale; and 4) each type of learning style diversity and each sub-scale of the team learning process scale. The correlations reveal no significant relationships (see Table 14). However, a positive significant relationship exists between learning style diversity and the team learning process when there is a control for team tenure (see Table 15). This finding is based on a regression that was conducted for Hypothesis 7b, which is discussed in more detail later.

Table 14

1-tailed Pearson Correlations between Learning Style Diversity and the Team Learning Process (N=33)

<table>
<thead>
<tr>
<th></th>
<th>Team Learning</th>
<th>Idea Creation</th>
<th>Planning</th>
<th>Decision-making</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Learning Style Diversity</td>
<td>r = .19, p&lt;.14</td>
<td>r = .12, p&lt;.24</td>
<td>r = .09, p&lt;.30</td>
<td>r = .07, p&lt;.33</td>
<td>r = .25, p&lt;.07</td>
</tr>
<tr>
<td>2. AE-RO Diversity</td>
<td>r = .08, p&lt;.31</td>
<td>r = .11, p&lt;.26</td>
<td>r = -.05, p&lt;.37</td>
<td>r = .01, p&lt;.46</td>
<td>r = .17, p&lt;.16</td>
</tr>
<tr>
<td>3. AC-CE Diversity</td>
<td>r = .14, p&lt;.21</td>
<td>r = .03, p&lt;.42</td>
<td>r = .16, p&lt;.18</td>
<td>r = .07, p&lt;.33</td>
<td>r = .13, p&lt;.22</td>
</tr>
</tbody>
</table>

** Correlation is significant at the .01 level (1-tailed)
* Correlation is significant at the .05 level (1-tailed)
Table 15

Results of Regression Analyses (Influences on the Team Learning Process) (N=33)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Style Diversity</td>
<td>.570</td>
<td>2.256</td>
<td>.032</td>
</tr>
</tbody>
</table>

**Hypothesis 4b.** Diverging Style, characterized by Concrete Experience (CE) and Reflective Observation (RO), is positively associated with Idea Creation.

The learning modes concrete experience and reflective observation were used for this analysis. The results reveal that no significance relationship exists between concrete experience and idea creation and reflective observation and idea creation (see Table 16).

**Hypothesis 4c.** Assimilating Style, characterized by Reflective Observation (RO) and Abstract Conceptualization (AC), is positively associated with Planning.

The learning modes reflective observation and abstract conceptualization were used for this analysis. The results reveal that no significance relationship exists between reflective observation and planning and abstract conceptualization and planning (see Table 16).

**Hypothesis 4d.** Converging Style, characterized by Abstract Conceptualization (AC) and Active Experimentation (AE), is positively associated with Decision-making.

The learning modes abstract conceptualization and active experimentation were used for this analysis. The results reveal that a significant positive relationship exists between abstract conceptualization and decision-making ($r = .38, p < .01$). The results
also reveal that a negative relationship exists between active experimentation and
decision-making \((r = -.32, p < .03)\). No significance relationship exists between abstract
conceptualization and decision-making (see Table 16).

**Hypothesis 4e.** Accommodating Style, characterized by Active Experimentation (AE and
Concrete Experience (CE), is positively associated with Implementation.

The learning modes active experimentation and concrete experience were used for
this analysis. The results reveal that no significance relationship exists between active
experimentation and implementation and concrete experience and implementation (see
Table 16).

**Table 16**

1-tailed Pearson Correlations between Learning Style and the Team Learning Process
\((N=33)\)

<table>
<thead>
<tr>
<th></th>
<th>Team Learning</th>
<th>Idea Creation</th>
<th>Planning</th>
<th>Decision-making</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CE</td>
<td>(r = .07, p&lt;.33)</td>
<td>(r = .18, p&lt;.15)</td>
<td>(r = -.02, p&lt;.44)</td>
<td>(r = .21, p&lt;.11)</td>
<td>(r = .06, p&lt;.35)</td>
</tr>
<tr>
<td>2. RO</td>
<td>(r = -.25, p&lt;.07)</td>
<td>(r = -.29, p&lt;.05)</td>
<td>(r = -.05, p&lt;.38)</td>
<td>(r = .01, p&lt;.46)</td>
<td>(r = .17, p&lt;.16)</td>
</tr>
<tr>
<td>3. AC</td>
<td>(r = .34*, p&lt;.02)</td>
<td>(r = .26, p&lt;.06)</td>
<td>(r = .27, p&lt;.06)</td>
<td>(r = .38*, p&lt;.01)</td>
<td>(r = .32*, p&lt;.03)</td>
</tr>
<tr>
<td>4. AE</td>
<td>(r = -.15, p&lt;.19)</td>
<td>(r = -.14, p&lt;.20)</td>
<td>(r = -.18, p&lt;.14)</td>
<td>(r = -.32*, p&lt;.03)</td>
<td>(r = -.05, p&lt;.38)</td>
</tr>
<tr>
<td>5. AE-RO</td>
<td>(r = .08, p&lt;.31)</td>
<td>(r = .11, p&lt;.26)</td>
<td>(r = -.05, p&lt;.37)</td>
<td>(r = .01, p&lt;.46)</td>
<td>(r = .17, p&lt;.16)</td>
</tr>
<tr>
<td>6. AC-CE</td>
<td>(r = .14, p&lt;.21)</td>
<td>(r = .03, p&lt;.42)</td>
<td>(r = .16, p&lt;.18)</td>
<td>(r = .07, p&lt;.33)</td>
<td>(r = .13, p&lt;.22)</td>
</tr>
</tbody>
</table>

**Correlation is significant at the .01 level (1-tailed)**

**Correlation is significant at the .05 level (1-tailed)**
**Hypothesis 5.** Learning Style Diversity is negatively associated with Process Conflict.

Pearson correlations were calculated between learning style diversity and process conflict. Additional Pearson correlations were calculated between each type of learning style diversity and process conflict. The results reveal a significant negative relationship between learning style diversity and process conflict, $r = -0.33 (33), p < .03$ (see Table 17).

**Table 17**

1-tailed Pearson Correlations between Learning Style Diversity and Process Conflict

<table>
<thead>
<tr>
<th></th>
<th>Process Conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Learning Style Diversity</td>
<td>$r = -0.33^*, p &lt; .03$</td>
</tr>
<tr>
<td>2. AE-RO Diversity</td>
<td>$r = -0.11, p &lt; .25$</td>
</tr>
<tr>
<td>3. AC-CE Diversity</td>
<td>$r = -0.27, p &lt; .05$</td>
</tr>
</tbody>
</table>

**Hypothesis 6.** Learning Style Diversity is positively associated with Team Performance.

A Pearson correlation was conducted to examine if a relationship exists between Learning Style Diversity and Team Performance. The results indicate that a significant positive relationship exists between Learning Style Diversity and Team Performance, $r = 0.29 (33), p < .04$ as well as Learning Style Diversity and “Our team achieves its goals”, $r = 0.35 (33), p < .20$ (see Table 18).
Table 18

1-tailed Pearson Correlations between Learning Style Diversity and Team Performance  
(N=33)

<table>
<thead>
<tr>
<th>Team Performance</th>
<th>Our team serves the purpose it is intended to serve.</th>
<th>Our team fulfills the products or services for those who receive or use it.</th>
<th>Critical quality errors occur frequently in our team (Reverse)</th>
<th>Our team does high quality work.</th>
<th>Our team achieves its goals.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Learning Style Diversity</td>
<td>$r = .29^*, p &lt; .04$</td>
<td>$r = .18, p &lt; .14$</td>
<td>$r = .27, p &lt; .06$</td>
<td>$r = .23, p &lt; .09$</td>
<td>$r = -.00, p &lt; .48$</td>
</tr>
<tr>
<td>2. AE-RO Diversity</td>
<td>$r = .27, p &lt; .06$</td>
<td>$r = .23, p &lt; .09$</td>
<td>$r = .16, p &lt; .17$</td>
<td>$r = .16, p &lt; .17$</td>
<td>$r = .10, p &lt; .27$</td>
</tr>
<tr>
<td>3. AC-CE Diversity</td>
<td>$r = .08, p &lt; .31$</td>
<td>$r = -.00, p &lt; .49$</td>
<td>$r = .16, p &lt; .17$</td>
<td>$r = .12, p &lt; .25$</td>
<td>$r = -.11, p &lt; .26$</td>
</tr>
</tbody>
</table>

** Correlation is significant at the .01 level (1-tailed)  
* Correlation is significant at the .05 level (1-tailed)

Hypothesis 7a. Higher levels of Team Tenure will diminish the negative associations between Demographic Diversity and the Team Learning Process.

Hypothesis 7b. Higher levels of Team Tenure will strengthen the positive associations between Learning Style Diversity and Team Learning.

To test hypotheses 7a and 7b, I used hierarchical moderated regression analyses. On the first step, I regressed each of the independent variables, demographic diversity and learning style diversity on the team learning process. On the second step, I regressed the moderator variable, team tenure on the team learning process. On the third step, I entered the interaction of each of the independent variables, demographic diversity and learning style diversity with the moderator variable into the equation (e.g., learning style diversity x team tenure). Hypothesis 7a was not supported. The interaction between team tenure and demographic diversity on the team learning process was not significant. On
the other hand, there was partial support for 7b. Team tenure was found to moderate the
effects of learning style diversity and the team learning process. The interaction between
learning style diversity and team tenure was more strongly related to the team learning
process when teams were together for a shorter period of time ($B = -.98, p<.01$).
Hypothesis 7b predicts that high levels of team tenure will increase the relationships
between learning style diversity and the team learning process. As shown in Table 19, a
higher level of team tenure decreased the relationship between learning style diversity
and the team learning process. This finding is opposite to what I hypothesized.

Table 19

*Interaction of Learning Style Diversity and Team Tenure in Predicting the Team Learning Process (N=33)*

<table>
<thead>
<tr>
<th>Step 1: Main effects</th>
<th>Team Learning Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Style Diversity</td>
<td>2.20</td>
</tr>
<tr>
<td>Team Tenure</td>
<td>-.17</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.05</td>
</tr>
<tr>
<td>$F$</td>
<td>.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2: Interaction effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Style Diversity</td>
</tr>
<tr>
<td>Team Tenure</td>
</tr>
<tr>
<td>Learning Style Diversity x Team Tenure</td>
</tr>
</tbody>
</table>

| Change in $R^2$ | .136 |
| $F$ change      | 4.673 |
| $R^2$           | .187 |
| Adjusted $R^2$  | .100 |
| $F$             | .039** |
Hypothesis 8. The Team Learning Process is positively associated with Team Performance.

Pearson correlations were calculated between the team learning process and team performance. Additional Pearson correlations were calculated between 1) each sub-scale of the team learning process scale and team performance; 2) the team learning process and each of the five items that comprise team performance; and 3) each sub-scale of the team learning and each of the five items that comprise team performance. The results indicate that a significant positive relationship exists between the team learning process and team performance, \( r = .63 \) (33), \( p < .001 \). Additional results reveal significant positive relationships between 1) each sub-scale of the team learning process scale and team performance; 2) the team learning process and each of the five items that comprise team performance; and 3) each sub-scale of the team learning process and each of the five items that comprise team performance (see Table 20).
### Table 20

**1-tailed Pearson Correlations between the Team Learning Process and Team Performance (N=33)**

<table>
<thead>
<tr>
<th>1. Team Learning</th>
<th>Team Performance</th>
<th>Our team serves the purpose it is intended to serve.</th>
<th>Our team fulfills the products or services for those who receive or use it.</th>
<th>Critical quality errors occur frequently in our team (Reverse)</th>
<th>Our team does high quality work.</th>
<th>Our team achieves its goals.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>r = .63</strong>*, p &lt; .001**</td>
<td><strong>r = .50</strong>*, p &lt; .001**</td>
<td><strong>r = .44</strong>*, p &lt; .001**</td>
<td><strong>r = .63</strong>*, p &lt; .001**</td>
<td><strong>r = .45</strong>*, p &lt; .001**</td>
<td></td>
</tr>
<tr>
<td>2. Idea Creation</td>
<td><strong>r = .56</strong>*, p &lt; .001**</td>
<td><strong>r = .46</strong>*, p &lt; .001**</td>
<td><strong>r = .41</strong>*, p &lt; .001**</td>
<td><strong>r = .63</strong>*, p &lt; .001**</td>
<td><em><em>r = .33</em>, p &lt; .02</em>*</td>
<td></td>
</tr>
<tr>
<td>3. Planning</td>
<td><strong>r = .47</strong>*, p &lt; .001**</td>
<td><strong>r = .33</strong>, p &lt; .02</td>
<td><strong>r = .42</strong>*, p &lt; .001**</td>
<td><em><em>r = .33</em>, p &lt; .02</em>*</td>
<td><em><em>r = .33</em>, p &lt; .02</em>*</td>
<td></td>
</tr>
<tr>
<td>4. Decision-making</td>
<td><strong>r = .58</strong>*, p &lt; .001**</td>
<td><strong>r = .52</strong>*, p &lt; .001**</td>
<td><em><em>r = .36</em>, p &lt; .01</em>*</td>
<td><em><em>r = .37</em>, p &lt; .01</em>*</td>
<td><strong>r = .60</strong>*, p &lt; .001**</td>
<td><strong>r = .48</strong>, p &lt; .02</td>
</tr>
<tr>
<td>5. Implementation</td>
<td><strong>r = .56</strong>*, p &lt; .001**</td>
<td><strong>r = .42</strong>*, p &lt; .001**</td>
<td><strong>r = .34</strong>, p &lt; .02</td>
<td><em><em>r = .33</em>, p &lt; .02</em>*</td>
<td><strong>r = .57</strong>*, p &lt; .001**</td>
<td><strong>r = .47</strong>, p &lt; .02</td>
</tr>
</tbody>
</table>

*** Correlation is significant at the .001 level (1-tailed)
** Correlation is significant at the .01 level (1-tailed)
* Correlation is significant at the .05 level (1-tailed)
**Hypothesis 9a.** The Team Learning Process mediates the relationships between Demographic Diversity and Team Performance.

To examine hypothesis 9a, mediation analyses using guidelines established by Baron and Kenny (1986) were conducted. A series of three regressions were conducted. First, Demographic Diversity scores were used to predict Team Performance, $F(1, 31) = .209, R^2 = .007, ns$; second, demographic diversity scores were used to predict team learning, $F(1, 39) = .364, R^2 = .012, ns$, and third, both demographic diversity scores and team learning were used to predict team performance, $F(2, 30) = 11.4, R^2 = .432, ns$. However, demographic diversity scores did not separately influence team performance. The conditions for mediation were not met – a relationship does not exist between demographic diversity and team performance to examine if team learning is a mediating variable. This regression equation suggests that demographic diversity accounts for 82% of the variance in team performance.

**Hypothesis 9b.** The Team Learning Process mediates the relationships between Learning Style Diversity and Team Performance.

To examine hypothesis 9b, mediation analyses as described above (See Hypothesis 6a) were conducted to assess if team learning mediates the relationship between learning style diversity and team performance. A series of three regressions were conducted. First, learning style diversity scores were used to predict team performance, $F(1, 31) = 2.980, R^2 = .088, ns$; second, learning style diversity scores were used to predict the team learning process, $F(1, 31) = 1.205, R^2 = .037, ns$, and third, both learning style diversity scores and team learning were used to predict team performance, $F(2, 30) =$
11.733, $R^2 = .440$, ns. However, learning style diversity scores did not separately influence team performance. The conditions for mediation were not met – a relationship does not exist between learning style diversity and team performance to examine if the team learning process is a mediating variable. This regression equation suggests that learning style diversity accounts for 29.6% of the variance in team performance.

**Hypothesis 10.** *The Team Learning Process is negatively associated with Process Conflict.*

Pearson correlations were calculated between both the team learning process and process conflict and between each sub-scale of the team learning process scale and process conflict. The results indicate that a significant negative relationship exists between the team learning process and process conflict, $r = -.66$ (33), $p < .001$. Additional results reveal significant negative relationships between idea creation and process conflict, $r = -.59$ (33), $p < .001$; planning and process conflict, $r = -.56$ (33), $p < .001$; decision-making and process conflict, $r = -.56$ (33), $p < .001$; implementation and process conflict, $r = -.53$ (33), $p < .001$ (see Table 21).
### Table 21

1-tailed Pearson Correlations between the Team Learning Process and Process Conflict  
(N=33)

<table>
<thead>
<tr>
<th>Process Conflict</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Team Learning</td>
<td>-.66</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2. Idea Creation</td>
<td>-.59</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3. Planning</td>
<td>-.56</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>4. Decision-making</td>
<td>-.56</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>5. Implementation</td>
<td>-.53</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

***Correlation is significant at the .001 level (1-tailed)  
** Correlation is significant at the .01 level (1-tailed)  
* Correlation is significant at the .05 level (1-tailed)

### Hypothesis 11. The relationship between the Team Learning Process and Team Performance is higher when the team’s task is Non-routine.

A Pearson correlation was conducted to examine if a relationship exists between team learning and team performance in teams where the task is both non-routine and routine. The results indicate that a significant positive relationship exists between team learning and team Performance in teams (see Table 22) where the task is non-routine,  

\[ r (33) = .54 \quad p < .01 \]  

As team learning increases, team performance increases. Similarly, a significant positive relationship exists between team learning and team performance in teams where the team’s task is non-routine,  

\[ r (33) = .41 \quad p < .05 \]  

(see Table 23). However, in teams where the team’s task is routine, this relationship is higher \( (r = .54) \) than versus teams where the task is routine, \( (r = .41) \).
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.9</td>
<td>0.15</td>
<td>0.00</td>
<td>0.04</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at the .01 level (2-tailed)
* Correlation is significant at the .05 level (2-tailed)

---

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at the .01 level (2-tailed)
* Correlation is significant at the .05 level (2-tailed)

---

1 Pearson correlations are not appropriate statistics for sample sizes smaller than 30. Based on this premise, the non-parametric test of Kendall Tau is used (Siegel & Castellan, 1988).
The implications of the findings presented in this chapter are more fully discussed in Chapter 5. I will identify key findings and discuss the limitations of the study as well as its contributions to theory, practice and future research.
CHAPTER 5: DISCUSSION AND LIMITATIONS

Prior organizational research reveals the team learning process as an important factor that influences team performance (Edmondson, 1999). Drawing on the social psychological and management literature, this study sought to better understand the effects of member composition: demographic diversity and learning style diversity on the team learning process – defined as a cycle of idea creation, planning, decision-making, and implementation – and the effects of the team learning process on team performance. The present study proposed to distinguish the process of the team learning process from previous studies (Edmondson, 1999; Gibson & Vermeulen, 2003), with a focus on experiencing the concrete (Kolb, 1984). That is, tangible, felt qualities of the world, relying on the senses and immersing oneself (or the team-as-a-whole) in concrete situations. With this in mind, I discuss the results of the study and then discuss theoretical and practical implications of the study’s overall findings. I also describe limitations of the study and propose implications for future research.

Study Findings

To date, no published study has examined the relationship between experiential learning theory and learning styles, demographic diversity, team learning and effectiveness, and team conflict all in one study. Before presenting the details of study’s findings, Table 26 provides a high-level summary of the hypotheses tested and the extent to which they were (or were not) supported.
### Table 26

**Summary of Research Hypotheses**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis 1.</strong> Demographic Diversity is negatively associated with the Team Learning Process.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 2.</strong> Demographic Diversity is positively associated with Process Conflict.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 3.</strong> Demographic Diversity is associated with Team Performance.</td>
<td>Partial Support</td>
</tr>
<tr>
<td><strong>Hypothesis 4a.</strong> Learning Style Diversity is positively associated with the Team Learning Process.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 4b.</strong> Diverging Style, characterized by Concrete Experience (CE) and Reflective Observation (RO), is positively associated with Idea Creation.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 4c.</strong> Assimilating Style, characterized by Reflective Observation (RO) and Abstract Conceptualization (AC), is positively associated with Planning.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 4d.</strong> Converging Style, characterized by Abstract Conceptualization (AC) and Active Experimentation (AE), is positively associated with Decision-making.</td>
<td>Partial Support</td>
</tr>
<tr>
<td><strong>Hypothesis 4e.</strong> Accommodating Style, characterized by Active Experimentation (AE and Concrete Experience (CE), is positively associated with Implementation.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 5.</strong> Learning Style Diversity is positively associated with Process Conflict.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 6.</strong> Learning Style Diversity is positively associated with Team Performance.</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 7a.</strong> Higher levels of Team Tenure will diminish the negative associations between Demographic Diversity and the Team Learning Process.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 7b.</strong> Higher levels of Team Tenure will strengthen the positive associations between Learning Style Diversity and the Team Learning Process.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 8.</strong> The Team Learning Process is positively associated with Team Performance.</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 9a.</strong> The Team Learning Process mediates the relationships between Demographic Diversity and Team Performance.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 9b.</strong> The Team Learning Process mediates the relationships between Learning Style Diversity and Team Performance.</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 10.</strong> The Team Learning Process is negatively associated with Process Conflict.</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>Hypothesis 11.</strong> The relationship between the Team Learning Process and Team Performance is higher when the team’s task is Non-routine.</td>
<td>Supported</td>
</tr>
</tbody>
</table>
In the following section, I highlight the seven key findings based on the research results from Chapter 4. The first four findings address the questions focused on the relationship between team diversity and the team learning process and the relationship between team diversity and outcomes of performance and process conflict. The last three key findings address the issues of mediation and moderation. Specifically, 1) the extent to which team tenure moderates the relationship between team diversity and the team learning process; 2) the extent to which the team learning process mediates the relationship between team diversity and outcomes of performance and process conflict; and 3) the extent to which team task moderates the relationship between team the team learning process and team performance. The seven key findings are as follows:

1. As predicted, there is a significant positive relationship between learning style diversity and team performance

2. There is a significant positive relationship between learning style diversity and the team learning process when team tenure is controlled

3. A significant negative relationship exists between learning style diversity and process conflict

4. Team Tenure moderates the relationship between learning style diversity and team learning when the team has been working together for a shorter period of time

5. As predicted, there is a significant positive relationship between team learning and team performance

6. There is a significant negative relationship between team learning and process conflict
7. Team Task moderates the relationship between team learning and team performance when the team’s task is non-routine

Key Finding #1: Learning Style Diversity and Team Performance

There is partial support for the relationship between the diversity of member composition and team performance as depicted in Hypothesis 6. The results of Hypothesis 6 reveal a significant positive relationship exists between learning style diversity and team performance. There is also a significant positive relationship that exists between learning style diversity and the extent to which the team achieves its goals. As such, these findings suggest that the more heterogeneous the team, based on learning styles, the more likely the team is to increase its performance and achieve its goals. This finding supports the literature (Milliken & Martins, 1996) in that many of the problem-solving enhancement effects of diversity frequently emerge from the less-observable or deep-level diversity that represent how members process information, such as a diverse set of knowledge, skills, and abilities to solve complex problems.

Key Finding #2: Learning Style Diversity and the Team Learning Process

Another finding is the positive and significant relationship between learning style diversity and the team learning process. The point that emerges from this finding is that this relationship is not as direct as it seems. This relationship occurs only when team tenure is controlled. When the team is making decisions or executing tasks, differences based on learning style might allow for consideration of different viewpoints that ultimately enhance the team’s performance. As such, this finding is consistent with
traditional group research, which emphasizes the importance of the team’s tenure to understand the impact of time on a team. As members spend more time working and interacting together, the surface-level diversity will be less salient and in contrast, deep-level diversity will be more salient. Proponents of this theoretical approach take a contingency perspective and argue that the effects of diversity depend on task and context characteristics (Gladstein, 1984; Hackman, 1987), including the team’s tenure or task non-routineness (Harrison et al., 1998; Jehn et al., 1999).

Key Finding #3: Learning Style Diversity and Process Conflict

There is no support for Hypothesis 5. However, the results indicate a significant negative relationship between learning style diversity and process conflict. As learning style diversity increases the degree of process conflict decreases. Meaning, heterogeneous learning style teams will have less process conflict than homogeneous learning style teams. This finding is contrary to the hypothesis. One explanation for this finding can be attributed to the average length of time of the organizational teams represented in the study’s sample. To resolve the inconsistency of this research finding, let us first consider the longer period of time members have been working together. For example, disagreements about task allocation may be less of an issue for teams who have been together for a longer period of time and have pre-established team norms or socially shared standards influence how team members perceive and interact with one another, approach decisions and solve problems. To illustrate further, members of an organization strategy consulting team typically bring to bear a series of specialized skills focused on leadership, organization design or change management. Any debate about resource
allocation based on the best fit of skills and duties within the team may be less of an issue for team members who have worked together on previous consulting assignments focused on organizational and change-related issues. The lack of debate can in turn enhance team performance. Thus, in organizational teams with a longer tenure, it may be possible to enhance team performance through team norms favoring the open discussion of member differences based on learning style.

Another finding or lack thereof is the relationship that was not found between demographic diversity and process conflict (Hypothesis 2). This finding may be attributed to the study’s neglect to consider that team members may have multiple characteristics on which they can differ simultaneously. In fact, this perspective is reflected in Lau and Murnighan’s (1998) group faultline concept. Faultlines are hypothetical dividing lines that can potentially split a team into two or more subgroups based on the alignment of two or more surface-level attributes (Lau & Murnighan, 1998). The more highly correlated team member characteristics are (e.g., the women are mid-career professionals), the stronger faultlines will increase the likelihood that homogenous subgroups will emerge (Lau & Murnighan, 2005; Pelled et al., 1999). This will likely affect team processes and outcomes (Lau & Murnighan, 1998). This may also induce team members to be less open to new ideas coming from other subgroups’ members (Gibson & Vermeulen, 2003) and to share less information, thereby intensifying subgroup polarization.

Recent research has indeed shown that if more than one characteristic of team members is salient, the faultline model has better explanatory qualities than does the traditional heterogeneity approach in predicting diversity effects on team outcomes (Lau
& Murnighan, 2005). The central idea here is that multiple dimensions of surface-level differences are likely to be salient at the same time and that their effects must therefore be considered simultaneously. For instance, members with weak faultlines may be prone to focus more on the team as a whole rather than with their own subgroup (Lau & Murnighan, 2005). By contrast, members of teams with strong diversity faultlines are expected to identify themselves with their own subgroup rather than with the entire team (Lau & Murnighan, 2005). This leads me to conclude that perhaps different dimensions of demographic diversity coexisted within organizational teams represented in the study’s sample. Subsequently, resulting in a lack of identification with the whole team and making members reluctant to contribute to the team learning process. This may have inhibited disagreements about task strategy and allocation of resources from occurring.

Diversity of Member Composition and Team Performance

There is partial support for Hypothesis 3. The results indicate a significant negative relationship between demographic diversity and “critical quality errors occur frequently in our team” (this question is reversed coded). This finding suggests that the lack of demographic diversity that exists within a team, the more critical quality errors will occur. A second finding is the significant positive relationship between both gender diversity and “our team serves the purpose it is intended to serve” and gender diversity and “our team achieves its goals.” This finding suggests that as the diversity of teams based on gender increases, the team’s ability to serve its purpose and achieve its goals increases. Lastly, a significant negative relationship was revealed between race diversity and “critical quality errors occur frequently in our team” and “our team does high quality
work.” This finding suggests that the lack of diversity based on race will increase the amount of error that occurs and interferes with the teams’ capacity to perform high quality work.

Key Finding #4: Team Tenure as Moderator

The hypothesis that team tenure moderates the relationship between the diversity of member composition and the team learning process was partially supported. Team Tenure moderates the relationship between learning style diversity and the team learning process when the team has a shorter tenure. The extensive team diversity literature describes surface and deep-level diversity effects as being different over time. The literature points to two primary reasons for this. The first explanation is that more team member interaction yields decreased surface-level diversity and increased deep-level diversity (Harrison et al., 1998). The second explanation involves research where informational diversity (heterogeneity in knowledge and perspectives) increases performance when social category diversity (heterogeneity in demographics) is low (Jehn et al.’s, 199). The two explanations that support my finding, then, suggest time provides the opportunity to acquire information, idiosyncratic patterns of behavior emerge and members learn about each other’s psychological similarities and dissimilarities.

Key Finding #5: The Team Learning Process and Team Performance

In addition, the hypothesis that the team learning process mediates the relationship between the diversity of member composition and team performance was also not supported. However, there is support for the relationship between the team
learning process and team performance (Hypothesis 8). A positive and significant relationship exists between the team learning process and team performance. This finding extends further research conducted by Edmondson (1999) and Gibson & Vermeulen (2003). This finding suggests that as the team learning process increases, team performance increases.

Key Finding #6: The Team Learning Process and Process Conflict

Process conflict is highly correlated with the team learning process and team performance. This correlation is significant and negative. This finding suggests that high levels of process conflict within the team may impede the team’s ability to develop innovative ideas as well as their ability to come to agreement and decide on what plan to take moving forward. Therefore, this limits the team’s ability to perform and collectively learn. Further support for this finding is found in teams where the task is both non-routine and routine. There is a significant and negative relationship between the team learning process and process conflict in teams where the task is non-routine. As process conflict increases, both the team learning process and team performance will decrease. Similar findings are revealed in teams with tasks that are routine. There is a significant and negative relationship between the team learning process and process conflict in teams where the task is routine. Another interesting finding worth noting in teams where the task is routine is the negative and significant relationship between learning style diversity and process conflict. As learning style diversity increases, process conflict decreases.
Key Finding #7: Team Task as Moderator

Further findings are that a significant positive relationship exists between the team learning process and team performance in teams where the task is non-routine. As the team learning process increases in teams where the task is non-routine, team performance increases. Similarly, a significant positive relationship was found between the team learning process and team performance in teams where the team’s task is non-routine. As the team learning process increases in teams where the task is routine, team performance increases. However, in team’s where the task is non-routine, this relationship is higher ($r = .54$) than teams where the task is routine ($r = .41$). These findings provide further support for the significance that the team learning process on team performance – regardless of whether the team’s task is routine or non-routine.

To conclude, there is support for the relationship between the team learning process and process conflict and team performance as moderated by team task. In teams where the tasks are non-routine, the team learning process and the lack of process conflict are very important. Meanwhile, in teams where the tasks are routine, learning style diversity is very important for both the team learning process and team performance.

Implications for Organizational Behavior

This study has several implications for the organizational behavior field. First, and perhaps the most obvious strength of this research study is the context with which it occurred – in real organizational settings. The field study design offered the advantage of increasing the organizational behavior field’s confidence that the research results have practical implications – not only for management and organizational behavior scholars,
but also for management consultants, organization development and change scholar-practitioners and consulting psychologists. Conducting this study in real-time organizations is a strength because it provides direct linkage to the diversity of teams (e.g., industry, age, level, type). Because a number of diverse kinds of organizations participated, it is reasonable to assume that this study may also have external validity. However, it also poses some methodological problems. Inferences about the team learning process derived from the results are based on survey research rather than direct observation – a factor that limits an assessment of the effects of differing organizational cultures, company practices and policies and so on.

Second, this study contributes to theories of the team learning process and team effectiveness. By focusing on the learning-oriented behaviors that are commensurate with experiential learning theory (Kolb, 1984), this study demonstrates clear linkages to the task and process aspects of traditional group dynamics theory. Along the same lines, this study demonstrates a strong relationship for translating constructive team behaviors into team performance.

Third, the findings reveal that process-oriented conflict affects the team’s learning and performance. In general, the results show that process factors can often help (the team learning process) or limit (process conflict) a team’s performance. Results also show that the diversity of member composition, based on learning style can help performance. The study also has relevance for teams that are trying to understand the implications between routine and non-routine tasks. For example, the team learning process and the lack of process conflict are very important in teams with non-routine
tasks. Meanwhile, learning style diversity is very important for the team learning process and team performance in teams with routine tasks.

Lastly, the results of the study indicate that teams with higher levels of abstract conceptualization are more prone to the team learning process. This suggests that organizational teams where the dominant learning mode is abstract conceptualization will tend to emphasize the use of logic, ideas, and concepts. Given that this study’s sample draws heavily from problem-solving and decision-making (e.g., consulting) teams within organizations, the dominant learning mode orientation tends to be highly instrumental for consultative teams that make systematic plans, manipulating abstract symbols, and using quantitative analysis.

**Research Implications**

The team learning process describes the process of gathering, sharing and acting upon knowledge to solve a specific problem (Gibson & Vermeulen, 2003). In examining the team composition-team learning-team effectiveness link, this study views organizational work teams as problem-solving and decision-making work groups. Deciding on how best to tackle management problems and deciding on how to implement decisions related to strategy, organization change, operational efficiency or leadership effectiveness are just a few examples that result from the interactions of team members. The type and variety of diverse perspectives, based on social and psychological attributes, represented on a team shape those interactions.

As a social process, the team learning process differs from individual learning in that it requires interaction between individuals. Thus, this study’s specific focus was the
link between the type and variety of organizational team members’ demographic and learning style perspectives, as measured by the compositional approach – and their effects on how these teams collectively learn and perform. Therefore, a primary implication of the findings is that investigating the team learning process and its implications on team performance is a fruitful one for understanding team behavior. This study thus adds to an emerging body of literature examining the notion of team-level learning. It further suggests that research on organizational teams can benefit from a deeper exploration on learning modes and process-oriented conflict, especially for understanding the effectiveness of the team learning process.

Theoretical Implications

My interest in the team learning process is consistent with recent emphasis in the field of organizational behavior. For example, the body of literature concerning the effects of the team learning process on team performance has grown substantially in recent years. Studies have been conducted in a wide variety of field settings, and the majority of these studies used comparable research designs and measures. Because multiple dimensions of the team learning process were often included in these studies, the fields of management and social and organizational psychology can be somewhat more confident that the effects on team performance are accurately attributed to the degree to which members engage in learning behaviors. In addition, this dissertation is grounded in a set of clearly articulated theoretical perspectives – including the rich theoretical background offered by social identity theory, social categorization and embedded
intergroup relations theory combined with experiential learning theory and team
effectiveness theory that frames this research.

By extending the logic of theories that explain individual attitudes and behavior,
the theories put forth in this dissertation provide a strong theoretical rationale for making
predictions about how demographic diversity and learning style diversity are likely to
influence social processes within organizational work teams. For example, previous
research assumes that diversity influences affective reactions and social processes within
teams (Jackson, et al., 2003). These social processes, in turn, are assumed to provide
explanations for the effects of diversity on team performance.

In addition, this study extends Jehn’s (1995; 1997) and Jehn et al’s (1999)
research on team conflict and team performance. Perhaps the most common cost of
process conflict is that it delays decision-making. Instead of taking action, members may
compete to gain others’ acceptance of their personal preferences, opinions or information
rather than support other team members’ preferences, opinions or information – or they
may feel the need to validate data and check them against alternative sources of
information. Because of the delays in making decisions, many attempts toward
implementation are consequently sabotaged and/or ignored. This, in turn, creates the lack
of follow-through and under-leveraging the team’s capability to adequately agree to
implement a required course of action in support of a better-informed outcome. Due to
the degree to which a high level of process conflict interferes with a team’s process,
achieving higher levels of the team learning process is an important pursuit for
organizational teams.
Practical Implications

The practical implications of this study for managers and team leaders are quite important. The implications flow directly from the theoretical implications. Most obviously, organizations that wish to motivate team productivity should pay close attention to the climate in which teams are able to learn collectively. Organizations should strive to create a climate that fosters a sense of support where teams learn from their work together and are able to publicly reflect on these experiences. An ethos of support can help members achieve alignment. In this way, members can deepen their relationships with one another and understand where each other is coming from. To facilitate this type of psychological membership to include trust, safety and inclusion, this study shows that interventions designed to promote teamwork alone may be less effective than interventions designed to promote learning and performance. For example, the chief challenge for a manager in assigning people to a project team is to evaluate their potential for helping the team achieve high performance. If a key factor in determining team performance is its capacity to access a wide range of the information, resources, or perspectives that are distributed throughout an organization, a manager or team leader would need to maximize such breadth of access. One approach to doing so is to assess prospective team members based on their deep-level characteristics.

Although this is not always possible, when managers have control over team formation, they can place together members by assessing the range of compositional characteristics in their organization to create high performing teams. If the team leader does not have control over team composition, he or she will still be able to manage the team’s process and consequently, its performance by identifying the learning styles and
learning style diversity within the team. This could take the form of an assessment of
learning styles using the Kolb Learning Style Inventory and/or facilitating the Kolb Team
Learning Experience (Kayes et al., 2005), a structured written simulation in which team
members learn about team functions while engaging in the processes of knowledge
creation, reflection, thinking and action. This would in turn, educate managers, team
leaders, and members on the benefits and detriments of learning style diversity and
collective forms of learning within organizational teams. Kolb’s (1976) research supports
this idea. When teams develop values which favor activities in one learning stage over
the other and these values are out of balance with organizational needs, managers can
help restore the appropriate balance.

Where feasible, learning styles should be more evenly distributed so that one style
does not dominate. Organizational teams with a more balanced composition, for example,
may avoid becoming too analytically focused as depicted by the study’s sample. Thus, an
exclusive or dominant analytic focus in teams would prevent teams from developing the
ability to employ feeling, intuitive understanding and sensitivity towards other members’
emotions and values; using reflective understanding to uncover how and why things
happen; or taking risks in getting things done and to take responsibility for accomplishing
objectives. Despite this, organizational teams with an abstract conceptualization
orientation can become the primary vehicle for demonstrating the precision associated
with the rigor of analyzing ideas and applying a scientific approach – characteristics that
are highly-valued in consulting firms.

Based on this study, diversity that leads to better team performance is diversity of
learning style, not necessarily demographic diversity. Despite this finding, this study
suggests that process trumps composition. In other words, not only is the team learning process a process that increases on a team’s task performance, it is a learning process that reduces the degree of process conflict. The team learning process is comprised of an experiential learning cycle directed to enable the team to integrate feedback into their problem-solving and decision-making process so that they can improve the team’s overall process as the team continues to work to accomplish its goals. Hence, interventions that can impact the team’s outcomes for success include better matching of team members’ learning style with team tasks focused on action taking – a process of achieving the team’s purpose (Kolb, 1984). This in turn, can enhance the team’s ability to make independent, well thought out decisions based on lessons learned with input from everyone on the team.

Another design choice that reduces process conflict and increases team performance is more clearly engaging the team’s capacity to learn collectively. Making teams aware of how their learning behavior or lack thereof is a good first step towards making members conscious of their tendencies to engage in dysfunctional behavior – an opportunity perhaps for action learning interventions to ensue. Yorks, O’Neil and Marsick (1999) define action learning as “an approach to working with and developing people that uses work on an actual project or problem as a way to learn. Participants work in small groups to take action to solve their problem and learn how to learn from that action. Often a learning coach works with the group in order to help the members learn how to balance their work with the learning from that work.” (p.3) The application of this approach to learning can enable teams to achieve higher levels of performance when they have the opportunity to generate new ideas, build on members’ different points of view,
accept and agree on different positions or issues and find a solution that can be executable. Such behavior can help build the foundation for effective team functioning and team results. Meanwhile, to inhibit process losses and foster process gains that may be caused by the degree of demographic diversity compared to learning style diversity is to tenure should be a key factor to manage the context-specific diversity attributes that enable a team to yield a healthy process and outcome.

Implications for Management Education

The use of teams has become an increasingly popular method to promote learning in management education (Kayes et al., 2004; Marsick et al., 2002). Many business schools adopt a team-based approach to projects. This approach is intended to model on-the-job situations. For instance, Case’s Weatherhead School of Management, Harvard Business School and The University of Michigan are just a few examples of business schools that have instituted an action learning course. This course is typically a one-year experiential course for second-year students. Using real-time problem solving approaches and other learning venues, action learning courses help student teams develop expertise in negotiation, organization development, interpersonal communication and leadership. During this course, students also learn team dynamics after having taken assessment instruments such as the Myers-Briggs Type Indicator, Emotional Competence Inventory or the Learning Styles Inventory. These assessments are administered to test to students’ psychological types and/or learning preferences.

Despite the increased use of teams in learning, taking a team-as-a-whole approach is an under-represented perspective in the field of management education. Business schools, for example, have been criticized for not preparing students with not providing
students with skills necessary for solving business problems or for working in teams (Doria, Rozanski, & Cohen, 2003; Gardner & Korth, 1998). I believe team learning that focuses on inquiry, reflection, deciding and execution can enable business school students at all levels prepare student teams to become more effective in how they learn and perform.

Based on the findings reported in this dissertation, I am confident progress can be made to the enhancement of management education, especially if, along with working toward an experientially based curriculum using the team learning dimensions, business schools are open to assessing their students learning style preferences for optimizing the team’s overall performance. Both elements stress the importance and relevance of having critical skills represented on the team and the explicit contract of learning collectively through team assignments.

**Research Limitations**

Despite these strengths, I recognize some notable weaknesses in my research. First, this study uses a moderate sized sample of individual respondents $N=181$ – which by definition, a sample size of 30 or more subjects reduces variance and increases the probability to the study being valid. However, because this study focuses on the group level analysis, the small sample of teams ($N=33$) suggests that this study is vulnerable to sampling errors. Replicating this research utilizing a larger sample of subjects may provide more reliable findings.

Second, the generalizability of this study is limited because in addition to the small sample size, the results are further constrained by the characteristics of the study
sample, particularly the skewness with regard to industry. That is, there are only six industries represented in this sample. This limits the generalizing the study’s findings. Thus, future research on demographic and learning style differences would benefit from an investigation conducted across multiple organizations in a single industry to ensure broader generalization of the results.

A final limitation concerns the measures used. Despite this study’s efforts to measure learning style diversity and examine its influence on team processes, the results offer few conclusive findings about the effects of learning style diversity on the team learning process and team performance. Conceptually, it makes sense that the diversity of demographic and learning attributes found within organizational teams is likely to influence social processes and subsequently, team outcomes. The results of this study did not address the challenge of empirically assessing the interactive effects for specific dimensions of diversity. This limitation should be addressed in the design, collection methods and analysis of future research in compositional differences in organizational teams.

Future Research Directions

The preceding discussion suggests several opportunities for future research. In addition to the issues of sample size, generalizability and measurement mentioned above, there are other areas that would improve the current study and extend team and experiential learning theories. One apparent opportunity is to identify and empirically test an index that measures Learning style diversity. For example, it is a valid assumption that how individual members of a team grasp and comprehend information to make critical
decisions will make the team learning process more salient within organizations, this may have important consequences for team and organizational dynamics. Furthermore, examining learning style diversity may increase the theoretical and practical relevance for more research in this area to be conducted in both the United States and abroad.

My findings are limited in that they focus on only one form of Jehn’s (1997) conflict typology – process conflict. Future research should focus on examining the effects of demographic diversity and the team learning process on task and relationship conflict. In addition, despite the measurement problem, this study provides further conceptual insights about affective and process outcomes. This suggests a continuing need to theorize about and test for the different types of effects of demographic and learning style diversity on how organizational teams function. For example, past research on team diversity has typically focused on the distribution of particular attributes within a team (Milliken & Martins, 1996). This research portends that the effects of team diversity depends on the degree to which team members differ in such attributes, considering only one attribute at a time. However, to understand the precise impact of diversity on the team learning process and team outcomes, organizational researchers will need to consider the different dimensions of diversity that may coexist within a team and examine how these dimensions interact. Specifically, the dimensions derived from the specific combination of demographic diversity as well as task-relevant deep-level diversity such as learning styles.
Conclusion

It is my belief that this study will add to organizational psychologists and management scholars understanding of work teams. The empirical support for the relationship between the team learning process and team performance adds to our understanding of how learning-oriented behaviors underlie healthy team functioning. The study results supported the view that the team learning process serves as an important team process that can influence team productivity. This study also showed that not all types of differences made a difference to team members’ interactions.

This dissertation’s findings suggest that teams will be more successful to the extent that team leaders can promote constructive discussions about milestones, task responsibilities and deadlines, early in the teams’ formation, while minimizing the potential for process conflict. These findings may explain the lack of relationship between demographic diversity and the team learning process or the interaction effect between learning style diversity and team tenure during the team’s early stages of formation. In fact, the designated leader’s ability to facilitate early process discussions, time pacing of tasks, and planning to meet resource requirements may be another factor that explains the contrary finding between the learning style diversity and team tenure interaction effect on the team learning process.

The study, although exploratory in nature, advances the field of organizational behavior by integrating theories of social identity and embedded intergroup relations to describe the relative social, cognitive and emotional dimensions of group behavior that may influence team processes. In this study, demographic diversity did not significantly impact members’ abilities to learn collectively. Instead, it was primarily process conflict.
that made a difference in team member interactions in terms of how much they engaged in learning versus engaging in process conflict. As mentioned above, the more process conflict decreases, the more the team learning process and team performance increases. However, there are times when the presence of process conflict can be threatening to the team learning process and team performance.

In conclusion, expanding team demography and diversity research to incorporate a greater diversity is an exciting opportunity for gaining new insights. Unfortunately, very little research has explored the connection between learning style as a diversity attribute and the team learning process. Nor has there been much theorizing on the frequency of member interaction as an underlying factor of that relationship. This study introduced the concept of learning style diversity and linked it to demography and diversity and team effectiveness theories. In doing so, the study incorporates learning style as a deep-level (psychological) attribute to broaden the existing set of diversity variables that team researchers have not previously examined. The theoretical framework underpinning this research makes a supportive case for continued theory and practice-oriented research. My hope is that the contribution this study intends to make will spur greater scholarly interest in learning style as a diversity variable, in how work teams learn, and in the relationship between these separate areas of research.
APPENDICES
### A. IRB New Protocol Application

#### Protocol Title:
Team Learning in Organizations

<table>
<thead>
<tr>
<th>Responsible Investigator (RI): David A. Kolb, Ph.D.</th>
<th>RI Email: <a href="mailto:David.Kolb@case.edu">David.Kolb@case.edu</a></th>
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<tbody>
<tr>
<td>(faculty member or RI certified only)</td>
<td>(only if used)</td>
</tr>
<tr>
<td>RI Phone: (216) 368-2050</td>
<td>RI Fax:</td>
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<td>RI Dept.:</td>
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</tr>
<tr>
<td>Co-Investigator (CI): Claudy Jules</td>
<td>CI Email: <a href="mailto:claudy.jules@case.edu">claudy.jules@case.edu</a></td>
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<tr>
<td>(faculty, staff, student, post doc., etc.)</td>
<td>(only if used)</td>
</tr>
<tr>
<td>CI Phone: (301) 537-0296</td>
<td>CI Fax:</td>
</tr>
<tr>
<td>CI Dept.: Organizational Behavior</td>
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#### Does the RI have a faculty appointment?
- [x] Yes
- [ ] No

If no, has the RI submitted a RI Authorization Form?
- [x] Yes
- [ ] No

#### Special Participation Populations

- [ ] Minors (under 18)
- [ ] Pregnant Women
- [ ] Prisoners
- [ ] Physically Challenged
- [ ] Cognitively Impaired
- [ ] University Students or Employees
- [x] No Special Subject (check if nothing else applies)

#### Participant Age

- [ ] 0-7 (parent Perm. & Oral Child Assent)
- [ ] 8-17 (Parent Perm. & Written Child Assent)
- [x] 18-65
- [x] 65+

#### Participant Gender

- # of females 150
- # of males 150

#### Estimated Project Duration

- Start Date 7-15-06
- Completion Date 9-15-06

#### Will Participants be Compensated?
- [x] No
- [ ] Yes, What Type?

#### Will this research be funded in any way?

- [ ] Yes (see items 1-4 below)
- [x] No (go to next box)

1. **How will this research be funded?**

   - [ ] Departmental
   - [ ] Corp Sponsor/Private Found

2. **What is the source of funding (e.g., NIH)?**

   - [ ] Federal
   - [ ] Other

3. **What is the Grant Number?**

4. Submit one copy of the full grant application (salary information may be redacted).
**NOTE:** Does this research involve only the analysis of *publicly available OR non-identifiable existing* human subjects data/tissue/teeth?

- No - Complete all application questions
- Yes - Complete the following steps. [1] fill out this page, [2] answer item #9 (indicating the database or location from which the data/tissue/teeth will be drawn), and [3] complete the signature page on p.4.

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<tr>
<th>IRB Protocol Number</th>
<th>Date Received (stamp):</th>
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</table>

Education requirement met? (circle one) YES  NO

1. **Describe in detail how and where you will identify, recruit, and engage participants for this study, being sure to include a detailed description of your process for contacting, selecting, and excluding subjects.** If the proposed study will include children, describe the process for meeting requirements for parental permission and child assent. Include a description of the circumstances under which consent will be sought and obtained, who will seek it, the nature of the information to be provided to prospective subjects, and the method of documenting consent. Attach all advertisements, notices, emails, announcement scripts, recruitment letters, etc.

   I will initiate contact (letters and phone conversations) with members of internal organization development consulting and training groups to identify an appropriate research site. Once an organization(s) that is willing to participate has been identified, I will conduct an on-site visit to meet with the appropriate organization members to present a formal proposal describing my research topic, research design, the precise requirements for time and resources as well as the benefits to the organization for participating in the study. Because the unit of analysis is the group, it will be important to identify complete work teams. Therefore, I will work with the organizational representatives to identify potential teams and its respective members across functional or specialized departments and team types to participate in the study.

   To recruit participation to complete the surveys, I will work with the senior organization member to obtain a letter of cooperation signaling the organization’s approval of the study. Next, I will work with the organization development consultant and/or the senior organization member to draft a memo to be distributed to each functional manager/supervisor describing the study. The memo will be sent as an email announcement inviting his or her team’s participation in the study. Given the potential benefits of the research, the memo will also serve as a medium to endorse the study, increasing the likelihood of participation. Participation, however, will be voluntary and conducted through web-based assessments. The email memo will also include an invitation from the research containing a link to the respective website and instructions to commence the administration of the surveys. Participants will then read an informed consent form prior to proceeding to the online scales.
2. Check YES or NO for each item below to indicate if your research will involve the corresponding procedure:

<table>
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<th>Yes</th>
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<tr>
<td>☐ Deception/Punishment</td>
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<td>☒ Use of drugs or devices</td>
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<td>☐ Covert observation</td>
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<td>☐ Special participant populations (see previous page for list)</td>
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<td>☐ Induction of mental and/or physical stress</td>
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<td>☐ Procedures that may cause physical harm to the participant</td>
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<td>☐ Materials/Issues commonly regarded as socially unacceptable</td>
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<td>☐ Procedures that might be regarded as an invasion of privacy</td>
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3. For each item checked YES above, justify the necessity for it, and describe the precautions that will be taken to minimize risk. If your study involves DECEPTION, describe when and how the participants will be debriefed, and attach a copy of the DEBRIEFING SCRIPT.

4. Will any data be gathered with audio and/or visual recording devices?  ☒ No (go to item #5)  ☐ Yes (see below)

   If YES, (a) Describe how the security of the audio/video tapes will be protected and (b) state when the materials will be destroyed. Case IRB Suggestion: destroy within 3 years of the completion of the research.

5. Describe how you will maintain the confidentiality of the data. Specifically, (a) Will the data be individually identifiable, or will it be coded to mask participant identity? (b) If the data is coded, will there be any links to individually identifiable data (e.g., master list)? (c) Where will you keep the data? (d) How long will you keep the data and codes? (e) Who will have access to the data and codes?

To maintain anonymity, participants will not use their own names. In order to identify scales, participants will be asked to create an identification code which can be any word followed by any two digits from 1-10. The data will be kept by the researchers and will not necessarily be destroyed. Given the anonymity of the data, there are no risks involved. The researchers will only have access to the user codes, but the codes will have no link to identifiable participant information. Submitted responses will go to a secured server at Case Western Reserve University’s Weatherhead School of Management.
6. Will there be any reasonably foreseeable risks, discomforts, and inconveniences to participants in this research? If YES, 
   (a) describe the procedures to minimize risks, discomforts and/or inconveniences and 
   (b) justify why these risks, discomforts, and/or inconveniences are reasonable in relation to the anticipated benefits. 
   What additional safeguards will you implement that will protect the rights and welfare of participants who are likely to be vulnerable to coercion and undue influence, especially for vulnerable populations? Discuss why the risks to subjects are reasonable in relation to the anticipated benefits to subjects and others. 
   Describe planned procedures for protecting against or minimizing potential risks, including risks to confidentiality. Where appropriate, discuss plans for ensuring necessary medical or professional intervention in the event of adverse effects to the subjects. If the research involves greater than minimal risk, please describe the availability, if any, of compensation for research-related harms/injuries. If it involves greater than minimal risk, please provide provisions for monitoring the subjects response to research to ensure safety. 

There are no foreseeable risks by participating in this study. Participants will be informed that they are free to stop completion of the surveys at anytime. Whether or not they choose to participate, they will not be adversely impacted. 

7. Will there be any benefits to participants or to the community because of this research? 
   Examples: therapy, education, information, resources, empowerment 
   Note: Monetary compensation is not considered a benefit of participation 

Participants will be introduced to and receive a free copy of the Learning Style Inventory (LSI). The LSI identifies preferred learning styles, and explores the opportunities different styles present for: problem solving, working in teams, resolving conflict, communicating at work, communicating at home, or considering a career. As a team, members can look at their individual team member learning styles and explore the strengths and challenges that the learning style presents – particularly as it relates to specific team goals and tasks to accomplish work. 

8. Will you compensate research subjects? If YES, please explain how. If compensation is monetary, please provide the payment amount and the proposed method and timing of disbursement. Please include if payment will be pro-rated. 

Participants will be given the option of receiving a full Learning Styles Inventory analysis profile online, which will provide insight into how they learn and how they can leverage their styles to become better learners. This profile will be produced immediately following the completion of the online instrument. This benefits the participant by providing a valuable self-development instrument at no charge. 

9. Attach a brief summary (two-page max.) of your research, being sure to include the research. Indicate your current research questions, methods and procedures to be used, in addition to the current findings obtained where they apply, if applicable, and citations. Use lay language, which can be understood by someone unfamiliar with your area of research. Attach all survey instruments, interview scripts, letters of cooperation (if recruiting from institutions that do not have an IRB), tests, etc. 

Please refer to pages 9 and 10 of this application. For additional background, please refer to pages 11 through 21 of this application.
10. How will you protect the privacy of participants? Describe specifically how you will gather information from or about them. (NOTE: While confidentiality concerns data, privacy concerns people). 

EXAMPLES: People may be uncomfortable answering questions about their employer in an open cubicle, so investigators may arrange for a more private interview location. Or, people may not want to be seen in a place that might be stigmatizing to them, such as a pregnancy counseling center, so investigators may arrange for questionnaires to be mailed to subjects.

The questions asked regard how members of organizational teams learn and work together as well as the individual preferences for how people learn. The questions are administered online and kept on a secured server at Case Western Reserve University’s Weatherhead School of Management, ensuring the highest form of privacy.

11. In accordance with HIPAA, please indicate if you will collect data that includes Protected Health Information (PHI, see definition below)? PHI - Information, including demographic information, collected from an individual, that: 1) Is created or received by a health care provider, health plan, employer or health care clearinghouse [*see examples below*]; and 2) Relates to the past, present, or future physical or mental health or condition of an individual; the provision of health care to an individual; or the past, present, or future payment for the provision of health care to an individual; and 3)(i) That identifies the individual; or ii) With respect to which there is a reasonable basis to believe the information can be used to identify the individual; and 4) is transmitted or maintained in any form or medium. (45 CFR 160.103)

*For example, Dental Clinics, Student Health Services, and Governmental Health Agencies

☐ Yes (contact the IRB Administrator, Isabel Sánchez ias5@case.edu or 368-6993)
☒ No (go to next item)

12. Per federal regulations, written and signed informed consent is required unless an alteration is justifiable under 45 CFR 46.116(d), or §46.117(c).

Are you requesting an alteration or waiver?
☐ No (go to item #13)
☒ Yes (see below)

If YES, draft a justification statement, in which you describe EITHER why one or more of the required elements of informed consent must be waived for this research to be conducted, OR why the requirement to obtain a signature on the consent form must be waived for this research to be conducted.

13. Will you be obtaining consent from non-English speaking participants?
☐ No (go to item #14)
☒ Yes (see A & B below)

If YES,

A Describe (1) how the consent will translated (2) the language and cultural expertise of the investigators

B Submit a translated consent document, in addition to the English version.
14. Do any investigators participating in this study have a significant financial interest(s)* in any organization that would reasonably appear to be affected by the outcome of this research?

*A financial interest is a “significant financial interest” which must be disclosed if income from one company is expected to exceed $10,000 or more, or represents 5% or more ownership interest (total ownership interest of the faculty member, spouse and dependent children.)

- [ ] **No** (go to item #15)
- [x] **Yes** (see A and B below)

A. Was this interest reported on that individual’s most recent conflict of interest disclosure form?

- [ ] **No** (contact IRB Office for more information & complete Part B)
- [x] **Yes** (complete Part B)

B. Please include the following statement in the informed consent document:

> “Please note that the responsible investigator and/or other members of the research team have a significant financial interest in [choose one: the sponsor of this research OR the product being investigated in this study].”

15. Provide a description of the informed consent process, being sure to indicate, (a) how and from whom the potential subjects will receive the consent information/document and (b) where the informed consent interaction will occur. Include a copy of the informed consent document (ICD) that you plan to use. When drafting the ICD, use at least a 12-point font, write in 2nd person and at a reading level that is not greater than 8th grade or appropriate to subject population. Avoid using jargon and technical terms. *Note: for your assistance, an ICD template is provided at the following URL:*

http://ora.ra.Case.edu/orc_humansubjects_CASE_IRB.asp

Please see attached Appendix E.

16. Has this proposal, or a substantially similar one, been submitted, approved or disapproved by another IRB?

- [x] **No**
- [ ] **Yes** (Please provide a full explanation.)

17. Before you obtain the three required signatures, ensure that you have...

- [x] completed all of the education requirements
  (see [http://ora.ra.cwru.edu/orc_humansubjects.asp](http://ora.ra.cwru.edu/orc_humansubjects.asp) for more information)
- [x] attached all advertisements, flyers, recruitment emails
- [ ] (if deception will be involved) attached the debriefing script or letter
- [x] attached a summary, as well as all tests, interview scripts, instruments
- [x] attached copies of IRB approvals or (if the institution does not have an IRB) letters of cooperation, if applicable
- [x] attached the informed consent document (ICD) and (if applicable) child assent forms
- [ ] attached one copy of the full grant/funding application (if applicable)
By signing this application, investigators agree to abide by all of the University rules and regulations to protect human subjects in research. Investigators also agree to report to the Case IRB any and all adverse events and/or unanticipated problems with relation to this research.

"As the Responsible Investigator, I certify that all faculty, staff, and students involved with this proposal have or will receive appropriate training with regard to the protection of human subjects prior to the initiation of the research. I understand that I may be asked to provide written documentation of such training at any time during the study."

<table>
<thead>
<tr>
<th>Signature of Responsible Investigator (RI)</th>
<th>Date</th>
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<tr>
<th>Signature of Co- Investigator (CI)</th>
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<table>
<thead>
<tr>
<th>Signature of Department Chair or Dean (If Chair is an investigator, the Dean’s signature is required)</th>
<th>Date</th>
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</table>

Return completed application to: Case Western Reserve University IRB campus mail
Office of Research Compliance
Sears Library 6th floor, Room 657
Cleveland, OH 44106-7230

Questions?
Case IRB Website: http://ora.ra.cwru.edu/orc_humansubjects_CWRU_IRB.asp
Case IRB Assistant: Maureen Dore-Arshenovitz, mxd4@Case.edu OR 216.368.6925
Case IRB Administrator: Isabel Sánchez, CWRU-IRB@Case.edu OR 216.368.6993

--------------------------------------------------------------------------------------------------------------------------

CASE IRB USE ONLY--------------------------------------------------------------------------------------------------------------------------

- Exempt
- Expedited Review
- Full Review
  - §46.117(c)(1-2)
  - §46.116(d)

- Disapproved
  - §46.101b(1-6)
  - §46.110(1-9)
  - §46.40(4-7)
  - §46.306a2(A-D)

APPROVED
B. Research Summary for IRB

This dissertation research investigates the effects of team diversity on team learning, defined as a cycle of idea creation, planning, decision-making, and implementation. This dissertation looks at team learning in team-based organizations in the U.S., suggesting that these behaviors are all essential for optimal learning, which, in turn, can lead to improved team performance. Furthermore, it is hypothesized that team interaction time moderates the effect of team diversity on team learning, such that as members spend more time working together, the more likely the effects of demographic diversity on team learning behavior will diminish and the effects of learning style diversity will strengthen. Lastly, this study builds on previous research related to the diversity of learning style in teams to suggest that teams comprised of members where all four learning styles are represented will learn and perform better than teams comprised of members with similar learning styles. By the same token, heterogeneous learning style teams will respond and adapt to a wider range of demands in organizations. Drawing on the social psychological and management literature, the theory and research related to team diversity and demography, team learning, and team task performance guide my thinking and empirical investigation.

Research Questions

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

**Hypothesis 1a:** Demographic diversity will have a negative relationship with team performance.

**Hypothesis 1b:** Learning style diversity will have a positive relationship with team performance.

Research Question 2: Is team interaction time a moderating variable between team diversity and team learning behavior?

**Hypothesis 2a:** High levels of team interaction time will diminish the negative associations between demographic diversity and team learning behavior.

**Hypothesis 2b:** High levels of team interaction time will strengthen the positive associations between learning style diversity and team learning behavior.
Research Question 3: Is team learning behavior a mediating variable between the interaction of team diversity and team interaction time and outcomes of team performance?

Hypothesis 3a: Moderate to high levels of team learning behavior will have a positive and significant relationship with outcomes of team performance.

Hypothesis 3b: Team learning behavior mediates the relationship between the interaction of team diversity and team interaction time and outcomes of performance.

Research Question 4: What is the relationship between learning style diversity and team learning behavior?

Hypothesis 4a: Teams whose dominant learning preference is concrete experience, will be more likely to emphasize the idea creation dimension of the learning cycle than teams whose dominant learning preference is reflective observation, abstract conceptualization, or active experimentation.

Hypothesis 4b: Teams whose dominant learning preference is reflective observation will be more likely to emphasize the planning dimension of the learning cycle than teams whose dominant learning preference is abstract conceptualization, active experimentation, or concrete experience.

Hypothesis 4c: Teams whose dominant learning preference is abstract conceptualization will be more likely to emphasize the decision-making dimension of the learning cycle than teams whose dominant learning preference is active experimentation, concrete experience, or reflective observation.

Hypothesis 4d: Teams whose dominant learning preference is active experimentation, will be more likely to emphasize the implementation dimension of the learning cycle than teams whose dominant learning preference is concrete experience, reflective observation, or abstract conceptualization.

Theoretical Background

This study incorporates the work of a diverse group of scholars in social and organizational psychology and management. The theoretical framework is comprised of social identity (Tajfel & Turner, 1987), embedded intergroup (Alderfer, 1987), and experiential learning (Kolb, 1984) theories.

Method

Sample: The target population for the field study is a formally designated full-time work team (or unit) in one or more U.S. based organizations, which house functional teams to accomplish work. Functional teams may include, but are not limited to marketing, finance, human resources, operations, information systems, and specialized government agency divisions. The team should have members who report directly to the same manager or supervisor and interact to accomplish important team tasks.
**Data Gathering Methods:** Using survey research in a field study, participants will complete two online surveys (Appendix F and Appendix G) that are approximately 15-20 minutes in length. A copy of the informed consent form (Appendix E) of their agreement to participate and my use of the data will be provided. Each potential participant will receive an invitation letter from the organization members and researcher (Appendix D) via e-mail asking for his or her participation. The surveys can be completed on work premises. In the event there is less than seventy-five percent response rate for each team, the researcher will not use any collected data from individuals who participated.
C. Cover Letter to Potential Research Sites

To: [Company Name]
From: [Name of Organization Member]
[Title]
Subject: Participation in Research Study on Work Teams
Date: [to come]

Dear [Name of Organization Member]:

I am a Ph.D. candidate in organizational behavior at Case Western Reserve University. I am writing to invite your help with my dissertation, where I am studying how work teams learn.

My research is based on theories of team performance and experiential learning. [Name of Organization] is one of several companies identified for this research and was selected on the basis of its location, size, and work practices related to teams. As such, I am hoping to identify approximately twenty-five or more teams representing a range of types (e.g., project, cross-functional, management) who are willing to participate.

Participation in this research is voluntary and responses will be kept anonymous. If your organization chooses to participate, several teams must complete two separate surveys online. People fluent in English in 20 minutes or less can complete the two web-based surveys combined. Participants would be able to decline any question and would have the option to withdraw from participating at any time.

In return for your time and willingness to help, any participating team will be provided with an option to receive a customized Learning Styles Profile, which is a highly valuable educational and developmental tool that retails at $15.00, which they will be able to print out, reflect on, and retain for their use at no charge.

If you would like any additional information before deciding to participate, please feel free to contact me at (301) 537-0296 or Dr. David Kolb, Professor of Organizational Behavior, Case Western Reserve University at (216) 368-2050. I look forward to talking with you. Thank you.

Sincerely,

Claudy Jules
Doctoral Candidate
CASE | Weatherhead School of Management
D. Letter of Cooperation between Researcher and Participating Organization

[Company Name] agrees to participate in a research study with Claudy Jules as part of his doctoral dissertation research in organizational behavior. The purpose of this study is to ascertain information about how organizational teams learn and perform. This study will help [Company Name] understand how the preferred styles of learning can facilitate learning behavior (e.g., planning and decision-making).

This letter of cooperation constitutes a research contract between [Company Name] and Claudy Jules, and includes guidelines covering 1) confidentiality of [Company Name], 2) the confidentiality of the individuals/teams participating in the study, 3) the sharing of information between Claudy Jules and his dissertation research committee, and 4) the general relationship between Claudy Jules and representatives from the [Company Name] research advisory council in managing the research study.

Organizational Confidentiality
Claudy Jules will ensure the confidentiality of [Company Name]. [Company Name] will not be named, or described in any way that permits explicit identification in any literature viewed by non-[Company Name] employees. Claudy Jules will disguise the identity of [Company Name] in any future publication.

Individual Confidentiality
Claudy Jules will ensure the confidentiality of individual [Company Name] employees and teams participating in this study. [Company Name] employees and teams will not be named, or described in any way that permits explicit identification in any literature viewed by non-[Company Name] employees. Claudy Jules will disguise the identity of [Company Name] teams in any future publication.

Relationship with Dissertation Research Committee
Claudy Jules is permitted to share information relevant to his research with the members of his dissertation research committee. Members of the research committee are asked to respect and adhere to the conditions of confidentiality of [Company Name].

[Company Name] Research Advisory Council
Claudy Jules’ point-of-contact at [Company Name] will be [Senior Organization Member Name]. Procedures for identifying and recruiting participants to complete two online surveys will be determined in consultation with [Senior Organization Member Name]. In return for our time and willingness to help, any participating team will be provided with an option to receive a customized Learning Styles Profile that retails at $15.00, which they will be able to print out, reflect on, and retain for their use at no charge.

Claudy Jules reserves the right to publish general findings from the study upon ensuring all data gathered will be anonymous. The data gathered will be presented in its aggregate form in order to preserve the anonymity of participants. The estimated time period for completing the two online surveys is two weeks. The surveys are expected to be available at the end of July and through the beginning of August.

_______ Yes, I agree to the conditions set forth in the above letter of cooperation.
_______ No, I do not agree to the conditions set forth in the above letter of cooperation.

Print Name: _________________________________
Signature: ___________________________  Date: ____________
Print Name: ___________________________
Signature: ___________________________  Date: ____________
E. Email from Organization Member Describing Research to Potential Participants

To: [Team Name]

From: [Name of Organization Member]
[Title]

Subject: Participation in Research Study on Organizational Teams

Date: [to come]

Dear XX:

This summer [Organization Name] is fortunate to participate in a study on how teams learn in organizations using two online surveys that should take between 15-20 minutes. You are being asked to participate in the study because of our organization’s reliance on teams to accomplish work.

Enclosed with this email is an invitation from the researcher, Claudy Jules, to participate in this study as part of his dissertation. Claudy is pursuing his Ph.D. in organizational behavior at the Weatherhead School of Management at Case Western University. The purpose of his study is to understand the relationship between team composition, team learning, and team performance.

Please note: To preserve confidentiality, I will never learn about your responses or whether or not you participated. Whether you choose to participate or not, your employment status will not be adversely impacted.

Your participation is completely voluntary. Individual responses will be kept anonymous. Any report published resulting from this research will be reported in its aggregate and will not include information that will identify you. This process will provide you with an option to receive a customized Learning Styles Profile, which is a highly valuable educational and developmental tool that retails at $15.00, which you will be able to print out and retain for your use at no charge.

I am happy to answer any questions you have about how this can support your team’s effectiveness. Please don’t hesitate to contact me either in the office at (xxx) xxx-xxxx or via email at xxx@xx.com. If, after reading his invitation and instructions, you have specific questions about the study, please call Claudy directly at (301) 537-0296.

Sincerely,

[Name of Organization Member]
F. Invitation Letter as Part of Email Memo to Participants from Researcher

Date

Dear Participant:

My name is Claudy Jules and I am doctoral candidate in the Department of Organizational Behavior at Case Western Reserve University. I’d like to invite you to participate in a survey that’s part of my doctoral dissertation research. I’m studying the relationship between team composition, team learning, and its implications for team performance.

If you decide to participate in this study you will have the right to discontinue participation at any time without penalty. There are no risks associated with your participation in this study. All data collected will remain anonymous and be coded so it can not be linked with your name.

If you have any questions about participating in this study before beginning, please feel free to contact me at (301) 537-0296, or my dissertation advisor, Professor David Kolb of the CASE | Weatherhead School of Management at (216) 368-2050.

I appreciate your time and effort in helping me gather the data necessary for me to complete my dissertation! If you are interested and willing to participate, please click here: [website link].

Sincerely,

Claudy Jules
Ph.D. Candidate in Organizational Behavior
CASE | Weatherhead School of Management
G. Informed Consent Form and Scale Items

Case Western Reserve University Informed Consent Form

ALL OF THE TEXT IN FORMS A AND B WILL BE ON THE WEBPAGE THAT PARTICIPANTS OPEN ONCE THEY CLICK A PROVIDED LINK.

FORM A

Background Information on the Study

The purpose of this research is to understand the relationship between team composition, team learning, and team performance. Should you choose to participate, the information you provide will be used to inform research that will result in the researcher’s dissertation.

Confidentiality

You are being asked to participate in the study because of your organization’s reliance on teams to accomplish work. Any report published resulting from this research will be reported in its aggregate and will not include information that will identify you. Only the researchers will have access to the data collected and all results will be anonymous. Case Western Reserve University’s Institutional Review Board (IRB) may review the research to ensure that the rights of human subjects are adequately protected.

Should you agree to participating you will complete short surveys from two different websites. You are currently on the first website and will only have to follow the directions here until the second website is provided. Upon agreeing to participate, an identification code will be provided to you to preserve anonymity. This will help to ensure that your responses are entered to reflect your identification code in both websites accurately.

Procedures

The first part of this online survey includes several subsections. After these are completed, you will be provided with a link to a web-based Learning Style Inventory (LSI). The total time required to participate is approximately 15-20 minutes. In return for your participation, you will be provided with an option to receive a complimentary LSI profile that can be generated automatically upon completion of the surveys. The LSI profile is educational, developmental and retails at $15.00, provided to you free of charge. The LSI profile provides a framework for you to understand your learning preferences.

Results from this study will be used for my dissertation and may also be published in academic journals upon ensuring all data gathered preserves the anonymity of participants. I will not include any information that will make it possible to identify you as an individual. Under no circumstances will your individual responses ever be made known to anyone at your organization. Your submitted responses will go to a secured server at Case Western Reserve University’s Weatherhead School of Management.

Your participation in this study is voluntary and may be withdrawn at any time without negative consequences. If you choose not to participate, this will not affect your current or future employment status. There is no penalty for not participating or discontinuing your participation.
If you end the survey prematurely, you will not receive an LSI profile, because the full set of information required to generate the profile online will not have been submitted.
**Contact and Questions**

The researchers conducting this study are Dr. David Kolb and Claudy Jules. If you have questions, please feel free to contact Claudy Jules at (301) 537-0296 or claudy.jules@case.edu.

If the researcher cannot be reached, or if you would like to talk to someone other than the researchers about: (1) questions regarding this study, (2) research participation rights, (3) research-related inquiries, or (4) other human subjects issues, please contact Case Western Reserve University’s Institutional Review Board at (216) 368-69-25 or write: Case Western Reserve University; Institutional Review Board; 10900 Euclid Ave., Cleveland, OH 44106-7230.

**Statement of Consent**

I have read the above information and understand that agreeing to participate in this study involves completing survey items.

I understand that findings from this study may be used as part of a dissertation and research publications. I understand that my name will remain anonymous.

I understand that if I have further questions or concerns, I may contact Claudy Jules at (301) 537-0296.

Based upon this information:

- [ ] Yes, I agree to participate in this research study.
- [ ] No, I do not agree to participate in this research study.
FORM B

Case Western Reserve University Questionnaire Protocol

To maintain your anonymity, you will need to do the following:

1. **Enter your ID Code in the username section:** This will be a user ID Code which will be any word followed by any two digits from 1-10. Examples include “bliss23” or “train49”.

2. **Enter a password:** This is a personal password of your choice but it must be 6 characters only (no more, no less!).

3. **Enter the organizational password:** This is a password that will be provided to them.

Furthermore, this survey is designed to be completed entirely at one time. There will be no data-saving options, nor an option to return at a later time to complete unfinished surveys. Therefore, if you choose to participate, you are being asked to complete the entire survey in one sitting.

Please enter the following information below:

**Participant Identification Code** _________________________________

**Password** _________________________________

**Organizational Password** _________________________________

In exchange for your time and willingness to help, you will be provided with an opportunity to reflect on your learning style and a copy of your customized Learning Style Profile, free of charge.

Before we begin I would like to reiterate that what you share will be held anonymous. You will never be identified by the information you provide. **No one in your organization will have access to any of your individual survey data.**

Specific instructions are provided at the beginning of each section of the survey. As a participant in this survey process, which should take approximately 15-20 minutes, you are free to decline answering any questions. You may also end this process at any time should you feel the need to do so. If at any point you choose to stop participating, please feel free to close your webpage browser. Again, in order for the data to be useful to the study, and for you to receive a customized learning style inventory report, you need to complete the entire survey process in one sitting, as there are no data saving mechanisms that would enable you to complete part of the survey and return to complete the rest at a later time.

**Thank you very much for contributing your time to this research study!**
H. Team Learning Inventory

Instructions

Below you will be asked to answer questions related to how you perceive the extent to which your team is engaged in learning and how these processes foster or impede performance. To respond to these questions, think about each statement in terms of your present experience with your team. Please answer according to what really reflects your team rather than what you think your team should be. Please treat each item separately from every other item.

Your participation in this survey is voluntary but encouraged. Your responses are completely anonymous. Only an aggregated score for the entire team will be measured, not your individual response.

Please Note: On the following sections, indicate how accurate or inaccurate each statement is by clicking how well each statement describes your experience in the team in which you are currently a member. If you are a member of a management team, please use this team as your reference team. If you are a member of multiple non-management teams, please use the team where you report directly to a manager or supervisor as your reference team. Please be sure to complete all sections.

Section I
Click the number representing how accurately each statement reflects your team.

<table>
<thead>
<tr>
<th></th>
<th>1 Very Inaccurate</th>
<th>2 Mostly Inaccurate</th>
<th>3 Slightly Inaccurate</th>
<th>4 Neutral</th>
<th>5 Slightly Accurate</th>
<th>6 Mostly Accurate</th>
<th>7 Very Accurate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This team comes up with many new ideas about how work should be done.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>In making decisions, our team weighs the costs and benefits of possible solutions.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>This team carefully plans for how we will proceed with our work.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>We often learn through trying out new behaviors.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Team members maintain a high level of idea exchange to capture our good ideas.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Our process of making decisions is cooperative.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>This team is good at organizing the data (ideas) that are generated.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Members try out new approaches to their jobs as a result of</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
the team’s work.

9  Our team serves the purpose it is intended to serve.

10 Our work is routine.

11 As a team, everyone has a chance to express their opinion.

12 Our team has a hard time making decisions.

13 This team makes time to consider alternative solutions before taking action.

14 We are very good at implementing the decisions we make.

15 This team has members who are sensitive to each other’s feelings.

16 This team is good at testing theories and ideas to accomplish its work.

17 Our team fulfills the products or services for those who receive or use it.

18 People in this team do about the same job in the same way most of the time.

19 Critical quality errors occur frequently in this team.

20 Team members perform repetitive activities in time.

21 Our team does high quality work.

22 When we implement actions, we receive feedback on the results.

23 Our team achieves its goals.

24 How often do members of your team disagree about who should do what?

25 How frequently do members of your team disagree about the way to complete a team task?

26 How much disagreement is there about delegation of tasks within your team?
Section II

Please enter the appropriate number that accurately reflects your team.

On a monthly basis, how many times do members of your team spend interacting with:

27 …you individually in a team meeting or face-to-face to share information about the team’s work. ___

28 …the total team in a team meeting or face-to-face to share information about the team’s work. ___

29 … you individually through emails, telephone conversations, and conference calls to share information about the team’s work. ___

30 … the total team through emails, telephone conversations, and conference calls to share information about the team’s work. ___

31 … you individually informally or “socializing” during or outside of work to. ___

32 … the total team informally or “socializing” during or outside of work. ___

Section III

Please enter the appropriate number that accurately reflects your team.

What percent of the time does the work done in your team consist of (must total 100%):

33 …creating ideas in which team members search for potential improvements to accomplish its work. ___ %

34 … planning, organizing ideas, probing and exchanging information, and providing feedback to members to accomplish its work. ___ %

35 … deciding which process or information will be used to accomplish its work. ___ %

36 … testing or implementing new ideas and solutions to accomplish its work. ___ %

____ 100 %
Section IV

The following biographical items will be used only in comparing the responses of different teams. None of the information will be used to identify you as an individual. No one will have access to these data except the researchers whose names appeared at the beginning of this survey.

<table>
<thead>
<tr>
<th>How many people are in your current team?</th>
<th>Company Department (or Function):</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long have you worked in this team?</td>
<td>How long have you worked in this company?</td>
</tr>
<tr>
<td>__________ years and ________ months</td>
<td>__________ years and ________ months</td>
</tr>
<tr>
<td>In what industry is your team/organization?</td>
<td>What is the name of your team?</td>
</tr>
</tbody>
</table>

Thank you! You have completed the first survey. All there is left to complete is a 12 item short survey! Please click the following link to be directed to a website where you will conduct the final survey in this process and you will be provided with a customized learning style report. Thank you in advance for your participation!

Please click on the following: website link (this will be hot-linked to www.hayresourcesdirect.haygroup.com/lsi/). If for some reason the blue colored link above is not working, simple copy and paste the link into you browser.

Thank you for your support and contribution to this study!
I. Team Learning Inventory Item Key

Idea Creation
I-1. This team comes up with many new ideas about how work should be done.
I-5. Team members maintain a high level of idea exchange to capture our good ideas.
I-11. As a team, everyone has a chance to express their opinion.
I-15. This team has members who are sensitive to each other’s feelings.

Planning
I-3. This team carefully plans for how we will proceed with our work.
I-16. This team is good at testing theories and ideas to accomplish its work.
I-13. This team makes time to consider alternative solutions before taking action.

Decision-making
I-2. In making decisions, our team weighs the cost and benefits of possible solutions.
I-6. Our process of making decisions is cooperative.
I-12. Our team has a hard time making decisions. (Reverse)

Implementation
I-4. We often learn through trying out new behaviors.
I-8. Members try out new approaches to their jobs as a result of the team’s work.
I-14. We are very good at implementing the decisions we make.
I-22. When we implement actions, we receive feedback on the results.

Team Performance
I-17. Our team fulfills the products or services for those who receive or use it.
I-23. Our team achieves its goals.
I-21. Our team does high quality work.
I-9. Our team serves the purpose it is intended to serve.
I-19. Critical quality errors occur frequently in our team. (Reverse)

Team Interaction Time
I-27. you individually in a team meeting or face-to-face to share information about the team’s work. ___
I-28. the total team in a team meeting or face-to-face to share information about the team’s work. ___
I-29. you individually through emails, telephone conversations, and conference calls to share information about the team’s work. ___
I-30. the total team through emails, telephone conversations, and conference calls to share information about the team’s work. ___
I-31. you individually informally or “socializing” during or outside of work to get to know you. ___
I-32. the total team informally or “socializing” during or outside of work to get to know you. ___

Team Task
I-10. Our work is routine.
I-18. People in this team do about the same job in the same way most of the time.
I-20. Team members perform repetitive activities in time.

Process Conflict
I-24. How often do members of your team disagree about who should do what?
I-25. How frequently do members of your team disagree about the way to complete a team task?
I-26. How much disagreement is there about delegation of tasks within your team?
J. Learning Style Inventory
K. Frequencies and Percents Tables for Participant Demographics

Table 1

*Frequencies and Percents for Participants Ethnicity (N=166; 15 Missing)*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>23</td>
<td>12.7</td>
</tr>
<tr>
<td>Caucasian</td>
<td>117</td>
<td>64.6</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>2.8</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>15</td>
<td>8.3</td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>1.1</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Table 2

*Frequencies and Percents for Participants Marital Status (N=166; 15 Missing)*

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>45</td>
<td>24.9</td>
</tr>
<tr>
<td>Married</td>
<td>95</td>
<td>52.5</td>
</tr>
<tr>
<td>Divorced</td>
<td>13</td>
<td>7.2</td>
</tr>
<tr>
<td>Live w/ Partner</td>
<td>10</td>
<td>5.5</td>
</tr>
<tr>
<td>Widowed</td>
<td>3</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Table 3

*Frequencies and Percents for Participants Country of Residence (N=168; 13 Missing)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>162</td>
<td>89.5</td>
</tr>
<tr>
<td>UK</td>
<td>1</td>
<td>.6</td>
</tr>
<tr>
<td>Belgium</td>
<td>3</td>
<td>1.7</td>
</tr>
<tr>
<td>India</td>
<td>1</td>
<td>.6</td>
</tr>
<tr>
<td>Canada</td>
<td>1</td>
<td>.6</td>
</tr>
</tbody>
</table>
Table 4

Frequencies and Percents for Participants Age Range (N=168; 13 Missing)

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 - 24</td>
<td>15</td>
<td>8.3</td>
</tr>
<tr>
<td>25 - 34</td>
<td>66</td>
<td>36.5</td>
</tr>
<tr>
<td>35 - 44</td>
<td>45</td>
<td>24.9</td>
</tr>
<tr>
<td>45 - 54</td>
<td>33</td>
<td>18.2</td>
</tr>
<tr>
<td>55 or More</td>
<td>9</td>
<td>5.0</td>
</tr>
</tbody>
</table>
Table 5

Frequencies and Percents for Teams (N=181)

<table>
<thead>
<tr>
<th>Team</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Systems Design</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>SSA</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>NASA</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>DHS</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Organization Change</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Performance Management</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>ODC</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>FTP</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>NCIS OOC</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Scientific Computing</td>
<td>7</td>
<td>3.5</td>
</tr>
<tr>
<td>OPD Recruiting</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Outreach</td>
<td>16</td>
<td>8.0</td>
</tr>
<tr>
<td>Behavioral Health</td>
<td>29</td>
<td>14.6</td>
</tr>
<tr>
<td>FEP/State</td>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td>Bursar's Office</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>LIT Technical</td>
<td>4</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Table 5 (Cont’d)

Frequencies and Percents for Teams (N=181)

<table>
<thead>
<tr>
<th>Team</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization Effectiveness</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Learning Partnerships</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Toxicologists</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>OPD Benefits</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>OPD HR</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>OPD HR UK</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>SNC FIN US</td>
<td>7</td>
<td>3.5</td>
</tr>
<tr>
<td>BCP</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>SNC FIN EU</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>FIN Deployment</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>PMO</td>
<td>11</td>
<td>5.5</td>
</tr>
<tr>
<td>Diversity Chi</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Diversity Hous</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Rail Team</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Programs Team</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Global Health</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>LIT Management</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Instructional Focus</td>
<td>7</td>
<td>3.5</td>
</tr>
</tbody>
</table>
### Table 6

*Frequencies and Percents for Participant Industry (N=181)*

<table>
<thead>
<tr>
<th>Industry</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consulting</td>
<td>67</td>
<td>37</td>
</tr>
<tr>
<td>IT/Software</td>
<td>41</td>
<td>22.7</td>
</tr>
<tr>
<td>Higher Education</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>60</td>
<td>33.1</td>
</tr>
<tr>
<td>Public Sector</td>
<td>8</td>
<td>4.4</td>
</tr>
<tr>
<td>Gas &amp; Oil</td>
<td>5</td>
<td>2.8</td>
</tr>
</tbody>
</table>

### Table 7

*Frequencies and Percents for Participants Job Level (N=168; 13 Missing)*

<table>
<thead>
<tr>
<th>Job Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Executive</td>
<td>3</td>
<td>1.7</td>
</tr>
<tr>
<td>Manager</td>
<td>35</td>
<td>19.3</td>
</tr>
<tr>
<td>Supervisor</td>
<td>17</td>
<td>9.4</td>
</tr>
<tr>
<td>Professional</td>
<td>62</td>
<td>34.3</td>
</tr>
<tr>
<td>Hourly/Administrative</td>
<td>51</td>
<td>28.2</td>
</tr>
</tbody>
</table>
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